THE IRON AGE

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Watching Details of Shop Management

A Chart System Giving Intimate Knowledge of the Relation of Sales and Costs to the Normal and to One Another

BY JOHN NELSON

The management of a manufacturing industry must profit by a system which gives at prescribed intervals the details of the routine of business, simply, clearly and with exactness. The busy man resents the necessity of wading through statistical information, unless it is of the most skeleton nature, and to get at the required facts is often impossible unless the figures are somewhat profuse, necessitating painstaking study. The ideal system is one which gives sufficient detail, in a form easy of analysis, with bewildering data eliminated.

An important house manufacturing machinery and iron castings has developed an effective method of getting at the essential facts of the progress of business by means of charts. The results from the cost system are plotted to present a graphic history of each month. The system is exceedingly simple, so simple in fact that the manager himself charts the records.

The keeping of the cost system is divided between several trustworthy clerks, neither of whom knows what the totals represent in their combination. The manager receives these figures at the end of each month. A few dots and the necessary connecting lines bring the charts to date. They constitute an exact record of sales and of the three great items of cost—labor, material and overhead. The charts may be divided into two classes, illustrations of which are given. One class is devoted to a comparison of totals of each of the several elements of business. That is to say, one complete chart is given up to sales, another to labor, still another to material, and a fourth to overhead. Each becomes a record of a series of years. In the illustration of this class portions of the record of each element are given on a single chart for the sake of comparison.

The second class of charts gives the fluctuations of all the elements from an estimated normal business. The normal condition is represented by a horizontal line. The variations in sales, and in each factor of cost, are indicated by the rise or fall of their respective lines. Were business absolutely normal the four lines would coincide with the horizontal line. Each factor has its own unit which regulates its fluctuation from the normal. For example, we will suppose that the normal line stands for $25,000 in monthly sales, $10,000 in labor, $5,000 in material, and $7,500 in overhead.

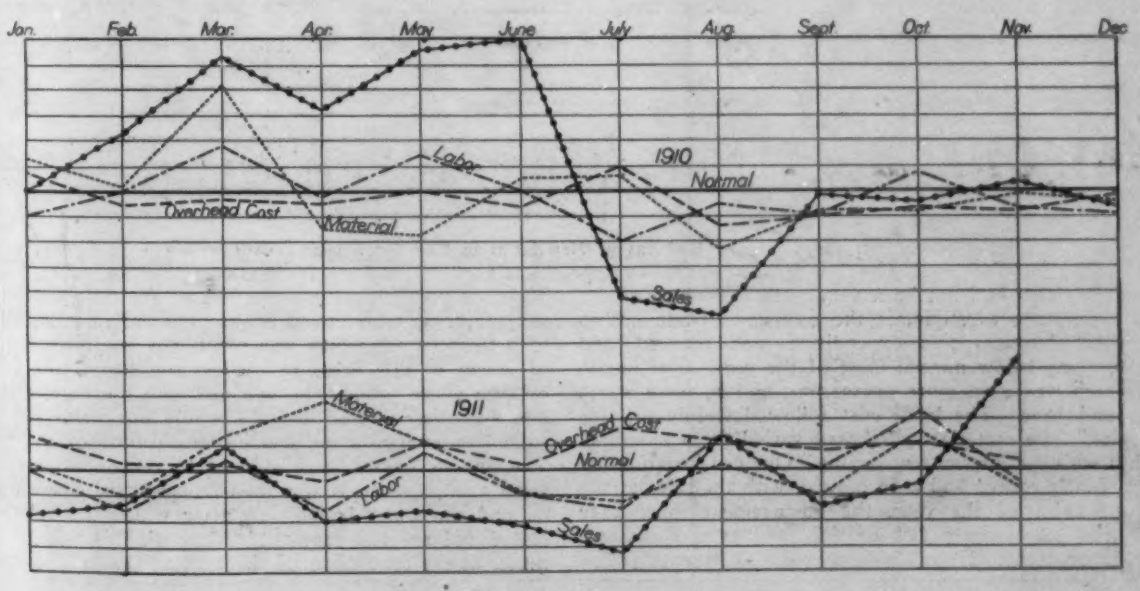


Chart of Fluctuations of Divisions of Manufacturing Cost Referred to the Normal

Each department has its own chart for each element of business and its own record of comparison with the normal. There is also a composite chart of each element, showing the relations to the normal of the works as a whole. It will be noted that the manager cannot fail to see any inconsistencies in the conduct of the works. Of course he is not wholly dependent upon his chart; he knows the business, its seasons and the market. He may look for a falling off in summer and for an autumn revival; for a first rate spring trade and a possible let-up during inventory season. He also has an intimate knowledge of general business conditions. He would be by no means helpless if he had no chart, nor any other general analyses of business into its various elements. But the charts enable him to make his decisions more intelligently and more accurately. They give him comparisons, prece-

dents, unusual current fluctuations, and abnormal discrepancies. They are a constant guide to his judgment and at the same time a constant check. They reveal miscalculations and confirm wise decisions.

As a manager glances at the results which come from the continuing of the lines to date, he may be made instantly aware that certain corrections in the conduct of his plant must be made. His overhead may be running unexpectedly high. Heavy expenditures for materials covering several succeeding months may indicate that the purchasing department is altogether too active. The line of labor may be too low considering the sales and what may be expected from the market in the way of orders.

The charts shown represent two business years. Taking the comparison chart for the year 1910 for example, sales chanced to be at normal when the curve was begun in January. The purchases of material and the overhead expenses were well above normal, while labor was below. The history of February, as shown by the lines, was that sales increased and with them the cost of labor, while the material purchased fell off because sufficient stocks were on hand. Overhead went down also. Previous to this

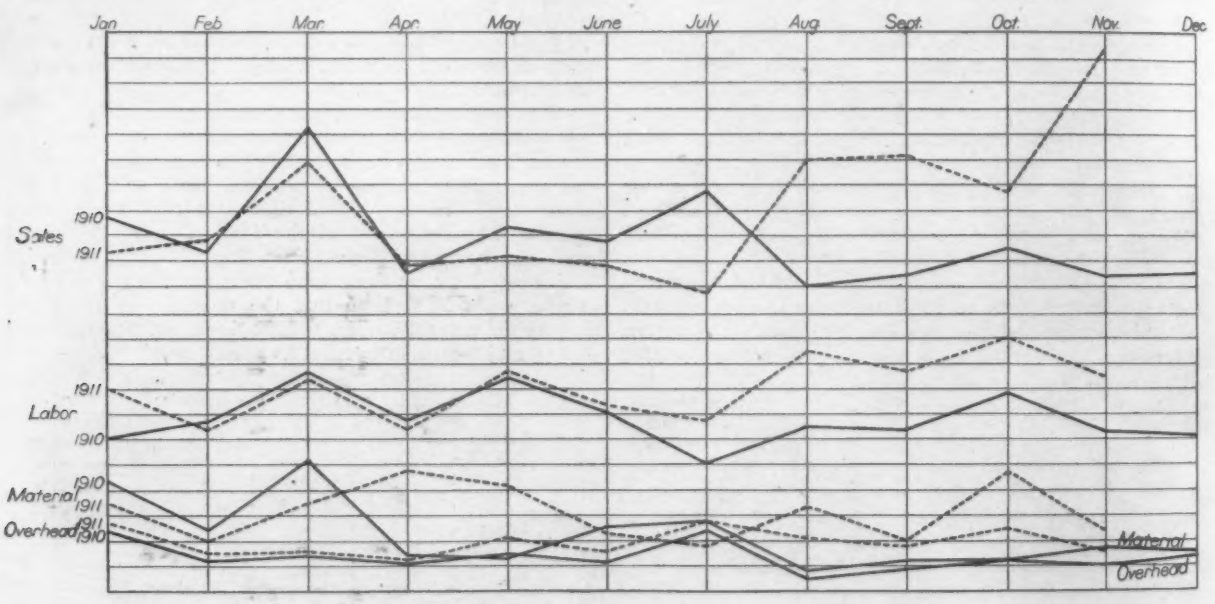


Chart for Comparing Divisions of Manufacturing Cost for Similar Periods

month business had not been very good and extra efforts had been made to stimulate the company's trade. With ascending business this expenditure was reduced, and stayed along below normal most of the year. The month of March was even more prosperous, and so were April, May and June. The labor cost followed closely the line of sales. The materials purchased varied from month to month with the intermittent buying. One can imagine that when June's record had been plotted, with the sales at the highest point of the year, the management must have looked to see business fall off, for summer was at hand. The labor cost had already been reduced in anticipation of a decreased business. On September 30, the management's policy of increasing production was indicated by the ascending line of labor. In the year 1911 the curve is purposely ended November 30 in order that the student may try for himself to find the lesson taught by the preceding month.

Originally, the company plotted these charts by weeks, but this was found to involve the system unnecessarily. Following a great principle of efficiency engineering, that a system should be made as simple as possible, the monthly plotting was adopted and has proved wholly satisfactory.

No one else in the office has all the information that the manager obtains from his charts, which is in itself a most excellent feature. The experience of not a few employers of labor is that their clerks know too much regarding the actual figures of business, for occasionally some one talks outside the office, a practice more common than many owners realize. Certain office people must be trusted, but the fewer the better when it comes to the figures of costs and profits or losses. Cases could be cited where a clerk has been actually stampeded by the showing of a loss instead of a profit. Having no knowledge of the actual condition of affairs beyond certain figures, he has gone so far as to abandon what seems to him a sinking ship, while his employer is taking the matter philosophically as one of the necessary incidents of business. On the other hand, the revelation to the clerk that profits are growing much larger may lend to his belief that the time is ripe for a request for higher wages.

Expansion Test of Kewanee Unions

An interesting expansion test was recently made on various sizes of Kewanee unions by the National Tube Company, Frick Building, Pittsburgh, Pa. In making this test, the unions were placed at the ends of T fittings and at the open end of the header pipe was one of the company's regrinding valves. At the start of each test this valve was closed and the steam turned on, with the result that it would endeavor to escape through the unions. Steam at 140 lb. pressure was left on for different periods varying from 5 min. to 92 hr. and the units became heated to a temperature which was practically equivalent to that of steam at this pressure. When the steam was turned off, the union joining the line test with the regular steam line was disconnected and the whole line immersed in a vat of water having an average temperature of 48 deg. F. The line of unions were allowed to remain in the water from 5 to 30 min. It was then replaced, the steam turned on and the water boiled out, after which the valve was closed and the test repeated. Although this was done 50 times, at the conclusion of the test, as far as it was possible to ascertain by a very close inspection, the unions were just as good as new for holding steam at this pressure. A malleable union was inserted in the line after the end of the ninth test and failed after 18 quenchings. A new gasket was put in, which failed after 13 more immersions and had to be tightened, and at the end of the fiftieth test the gasket was completely ruined. The unions tested were taken from stock and no special effort was made to select them.

The McKeen Motor Car Company, Omaha, Neb., builder of gasoline motor cars for railroad service, has opened a central sales district office in the Marquette Building, 140 Dearborn street, Chicago, with Edward E. Wright in charge. The district includes a wide expanse of territory, extending from Michigan and Wisconsin on the north to Alabama, Mississippi and Louisiana on the south. The company states that 47 railroads are operating or have ordered McKeen motor cars, 16 of which have placed repeat orders.

Mill Motors for Auxiliary Drives*

BY BRENT WILEY, PITTSBURGH, PA.†

The application of motors for driving the auxiliary apparatus in steel mills has been a gradual process during the past twenty years. These motors are required to operate in hot and dirty places and in the majority of cases with a gear drive. The mills are operated for 24 hr. per day, six days a week, and the work is of an extremely severe nature, requiring frequent starting and stopping, rapid acceleration and sudden stops. These several applications require motors ranging from 5 to 150 hp, with speeds of from approximately 800 to 450 r.p.m. Motors designed for industrial purposes were available only in a few types, and these were not very suitable for the severe requirements. The solution of the problem was to modify the series-wound direct-current motors used for street railway work for the sizes about 25 hp and the lighter types were used for these smaller sizes. Changes were made in the frames, the windings were made suitable for 250-volt circuits and the full load speeds were modified. While these motors gave good service, the cost of maintenance was high, and for the most severe reversing service the reliability was often questionable.

About 1905 a careful review of the situation was made in consultation with a majority of electrical engineers of the industry to ascertain the features which should be included in a mill type direct-current motor, and thus, by combining the skill and experience of the manufacturer and a mill engineer, a satisfactory design of motor has been developed. In this motor duplication of parts has been followed to a large extent to simplify the construction and maintenance of the motor. Cast steel should be used for the frame and this part arranged for easy inspection of parts. The armature should be so designed that the shaft can be removed without disturbing the windings or the commutator, and its flywheel effect should be low to minimize the power required for acceleration and reversing. The commutator should be of liberal design to overcome grounding, which was one of the most serious troubles in the older types. Commutation and the capacity of the motor from the standpoint of heating are the two principal factors to be taken into consideration in determining the proper size. The advance in the art of electrical engineering in the steel industry insures a more accurate selection of motor size for various applications, and the recently developed types of controllers provide special protection against unnecessarily severe conditions being imposed on the motors.

The steel industries have followed the lead of industrial plants and use alternating current on account of the economy of transmission and the wide range of practical sizes of generator units as compared with direct-current power. On account of the slow motor speed sometimes required 25 cycles has been adopted as a standard. This power has been utilized as directly as possible, and for this reason alternating-current motors are preferable for the auxiliary drives except where very rapid acceleration and frequent reversals are required. Here the direct-current series-wound motor is best suited, and these situations are few. The sizes of motor are the same as for direct-current, 5 to 150 hp, and the speeds range from 750 to 375 r.p.m. The general features of this motor should be the same as the direct-current one and the performance should be such that high starting torque is obtained with comparatively low starting current. A careful study of the requirements and the motor characteristics is necessary to obtain the best starting conditions with the alternating-current motor and is a much more important feature than for the direct-current motor. Generally the torque of the alternating-current motor is proportional to the current with properly regulated resistance steps. The starting torque of the direct-current series motor is in a somewhat greater proportion, twice the full load current giving two and one-half times the full load torque, and it is not necessary to govern the cutting out of the resistance so accurately to insure a continued high torque, although these conditions can be provided for in the case of the alternating-current motor by employing magnetic controllers. The inherent features of the alternating-current motors protect the driven machines from abnormal shock as well as protecting the motors themselves from mechanical abuse. The series-wound motor has high speed at light load, which is a desirable feature for the hoist of a crane motor. The speed of the alternating-current motor varies but little with change of load, and as a result a somewhat larger motor is required to give a speed which will be equivalent to the average light load and the full load speed obtained with the direct-current motor.

Motors designed with liberal starting torque will give satisfactory acceleration, and the proper application of the alternating-current mill motor to give satisfactory service is not only a question of motor characteristics, but more particularly includes a thorough understanding of the conditions to be met.

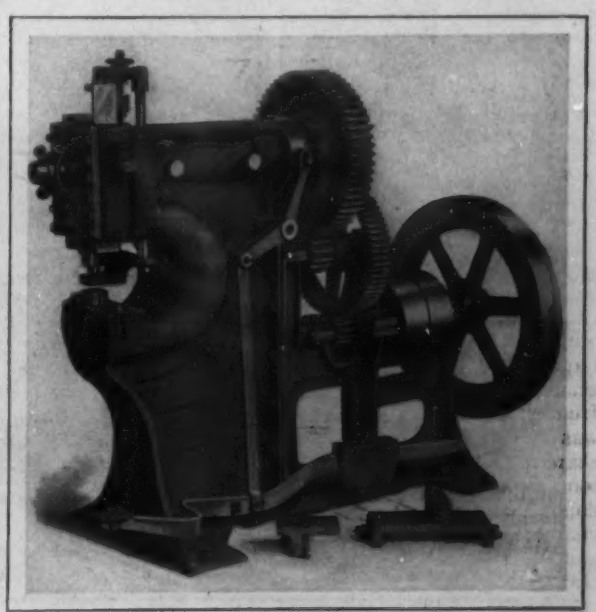
*From a paper read before the American Institute of Electrical Engineers, Pittsburgh, April 25-27.

†Commercial Engineer, Westinghouse Electric & Mfg. Company.

Combination Punch and Shear

A new type of punch and shear designed for accurate work in punching, shearing and stamping, has been recently brought out by the Bicknell Mfg. & Supply Company, Janesville, Wis. One of the special features of the tool is the heavy reinforcement around the throat which it is emphasized prevents springing when heavy work is being done.

This machine has cut gears, is double back geared and is practically noiseless in operation. It has a special stripper, which can be adjusted while in operation, and will punch to the center of a 16-in. circle. The maximum size of hole punched is 1 in. in ⅜-in. stock, but it will cut flat material up to ⅝ in. thick. The amount of floor space required is small, being only 51 by 27 in. The net weight is approximately 2500 lb.



The New No. 92 Combination Punch and Shear Built by the Bicknell Mfg. & Supply Company, Janesville, Wis.

New England Foundrymen's Association

The New England Foundrymen's Association held its monthly meeting at the Allyn House, Hartford, Conn., May 8. The party gathered in the afternoon and enjoyed an automobile about the city, the opportunity being given to visit the plants of the Pratt & Whitney Company, Underwood Typewriter Company, Pope Mfg. Company and Whitney Mfg. Company. After the dinner Dr. Bradley Stoughton gave a most interesting talk on "Principles of Blast Furnace Practice," illustrated by stereopticon views. Among the guests of the evening were Mayor Cheney of Hartford, Colonel Pope of the Pope Mfg. Company, President William F. Henney of the Hartford Chamber of Commerce and President Clarence E. Whitney of the Employers' Association.

The Allis-Chalmers Company has removed its New York office from the Empire Building to 30 Church street.

Mixtures for Chilled Car Wheels

Comparisons Showing the Longer Life of Old-Time Charcoal Product—Chemical Analysis Not Conclusive in Determining Strength

BY "IRONKEM."

A communication from Asa W. Whitney in trade papers of March and April gives many interesting details about mixtures for chilled wheels, but carries the subject into such intricate conclusions that it is rather difficult to follow. Mr. Whitney cites and agrees with Alex. E. Outerbridge, Jr., as to the number of chilled wheels made daily, considering 20,000 an excessive estimate. The annual report of the Master Car Builders' Association for 1909 gave the names and daily capacities of the wheel makers belonging to the Chilled Wheel Makers Association. The total capacity was about 20,000. This did not include the capacity of makers not belonging to the association, nor the output of chilled wheel shops of the Pennsylvania Railroad, the Chicago, Milwaukee & St. Paul Railroad and other railroad shops, nor the output of the Canadian wheel makers. Including these the daily output is easily over 20,000 wheels per day.

Mr. Whitney's estimate of the production of charcoal iron for 1911 at 400,000 tons was approximately the output for 1910, but it was largely of non-chilling grades, because the demand from chilled wheel makers was small. In 1911 the charcoal iron total was 278,000 tons. There is no doubt that the demand for charcoal iron from wheel makers is increasing and that the interest of many railroads in behalf of better wheels is growing.

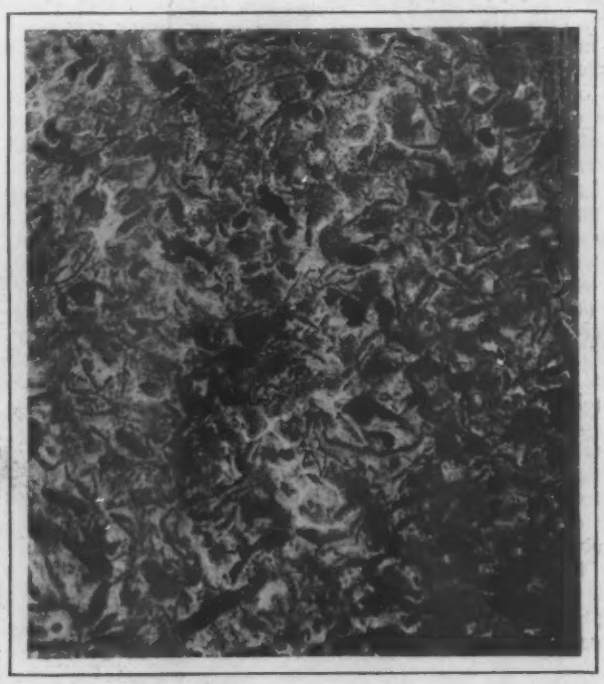


Fig. 1—Micrograph of A Wheel Made from Charcoal Iron. Magnification, 70 Diameters.

Shorter Life of Latter-Day Wheels

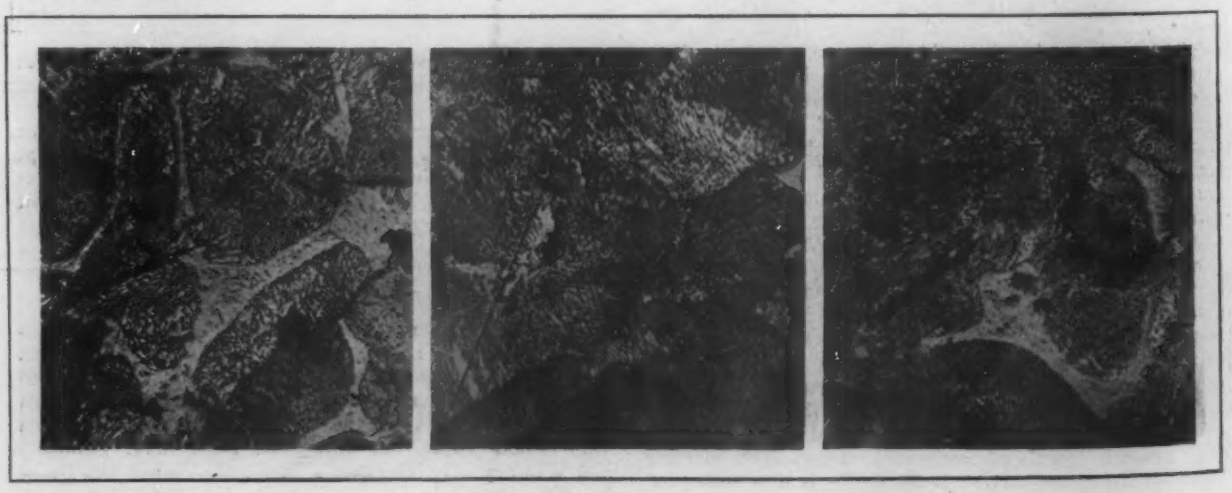
Mr. Whitney's statements would seem to point to the conclusion that as good wheels could be made from non-chilling coke iron as from charcoal iron, although he refers to the better quality and longer life of wheels made from charcoal iron some years ago, when cold blast and warm blast charcoal irons were made and extensively used. He refers to the statements made that the life of wheels of the quality made in later years was very much shorter.

The statement is made by railroad officials generally that the life of wheels under heavy freight equipment is not over 30,000 miles, which is but one-half of the 60,000 miles always guaranteed and which good wheels traveled when charcoal iron was largely used. Investigations have been made with some rather interesting developments, and these are given herewith.

How Prices of Wheels Are Fixed

It is the general opinion that the price of chilled wheels has been regulated by the competition of the wheel makers and that the deterioration in quality is on account of such competition. The fact is that the price of all wheels used for repairs to cars in transit is fixed by the Master Car Builders' rules, and any railroad paying more than the price so fixed does so to its loss. It is true that any railroad might buy wheels of a special quality to be used under its own equipment, but it would be necessary to keep such wheels separate and use them accordingly. This would be a complicated proceeding and not very practicable. Wheels of special quality might be ordered for new cars. As at least 50 per cent. of all repair wheels are charged to car owners under the M. C. B. rules, it is quite evident that the M. C. B. prices dominate the prices paid for new wheels.

The statement herewith also shows the annual production of charcoal iron, and it is interesting to note that as soon as the M. C. B. price for new wheels was reduced, as it was radically in 1893, and again very consider-



Figs. 2, 3 and 4—Micrographs of A Wheel. Magnification, 330 Diameters

Prices for New and Scrap Wheels Also Charcoal Pig Iron Production in the Period 1877-1910.

Year	Price for new wheels	Scrap allowance for wheel removed	Net price new wheel	Weight max. 33" diam., lb.	Price per 100 lb. net	Annual prod. Char. Iron Gr. tons
1877	$9.00	0.00	$9.00	525	$1.70	283,789
1878	9.00	0.00	9.00	525	1.70	261,963
1879	9.00	0.00	9.00	525	1.70	320,422
1880	9.00	0.00	9.00	525	1.70	479,963
1882	9.00	0.00	9.00	525	1.70	623,130
1883	8.00	0.00	8.00	525	1.70	510,469
1884	8.00	0.00	8.00	525	1.70	409,301
1885	11.00	5.00	6.00	550	1.09	357,064
1886	10.00	4.50	5.50	550	1.00	410,319
1887	10.00	4.50	5.50	550	1.00	516,234
1888	10.00	4.50	5.50	550	1.00	534,633
1889	10.00	4.50	5.50	550	1.00	575,268
1890	10.00	4.50	5.50	560	.98	628,145
1891	10.00	4.50	5.50	560	.98	576,964
1892	10.00	4.50	5.50	560	.98	537,621
1893	8.50	4.00	4.50	560	.80	386,789
1894	8.50	4.00	4.50	560	.80	222,422
1895	$6.50	3.00	$3.50	600	.58	225,341
1896	6.50	3.00	3.50	600	.58	310,244
1897	6.50	3.00	3.50	600	.58	255,211
1898	6.50	3.00	3.50	600	.58	296,750
1899	6.50	3.00	3.50	600	.58	289,766
1900	8.50	4.50	4.00	625	.58	389,482
1901	8.50	4.50	4.00	625	.64	383,441
1902	8.50	4.50	4.00	625	.64	390,169
1903	8.50	4.50	4.00	625	.64	505,684
1904	8.50	4.50	4.00	625	.64	337,529
1905	8.50	4.50	4.00	625	.64	352,928
1906	8.50	4.50	4.00	625	.64	433,007
1907	9.00	4.75	4.25	675	.63	437,397
1908	9.00	4.75	4.25	725	.58	249,146
1909	9.00	4.75	4.25	725	.58	376,003
1910	9.00	4.75	4.25	725	.58	396,507

ably in 1895, the production of charcoal iron fell off 50 per cent. and has only begun to reach its former proportions in the past three or four years, when it has approximated 400,000 tons a year. This later increase, however, has not been in connection with the requirements of chilled wheel makers to any extent until the last year or so, but on account of the demand from makers of high-grade castings and for uses where steel has been tried and found wanting.

Price Reductions and Wheel Quality

To whatever causes the shorter life of chilled wheels may also be ascribed, the conclusion is inevitable that the action of the M. C. B. Association in 1893 vitally affected the quality and subsequent service results. No one can deny that the changes in chilled wheel manufacture that were made about fifteen years ago must have been largely due to the new conditions brought about by reducing the price of chilled wheels to one-half what it had been during the preceding eight years and one-third what it was during the eight years preceding the latter period. The accompanying table will show the M. C. B. prices for car wheels in each year, as given in the annual reports of that association, and also the annual production of charcoal iron, taken from the Annual Reports of the American Iron and Steel Association.

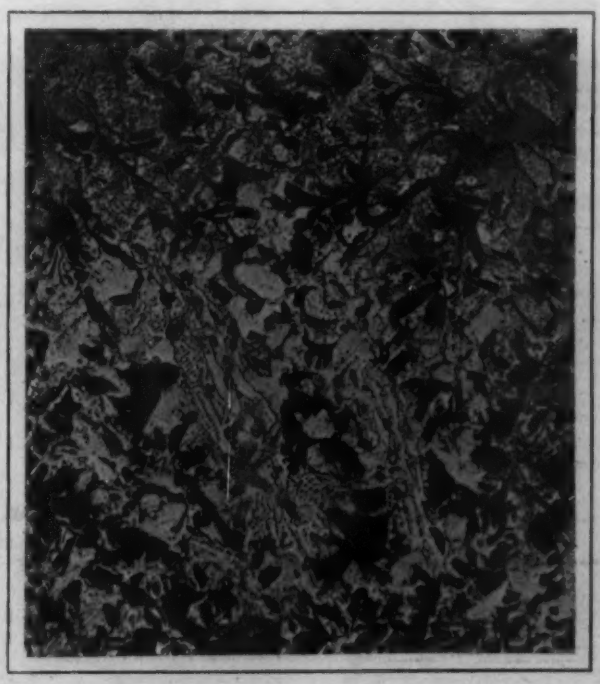


Fig. 5—Micrograph of B Wheel Made from Coke Iron. Magnification, 70 Diameters

Cars and Wheels in Use

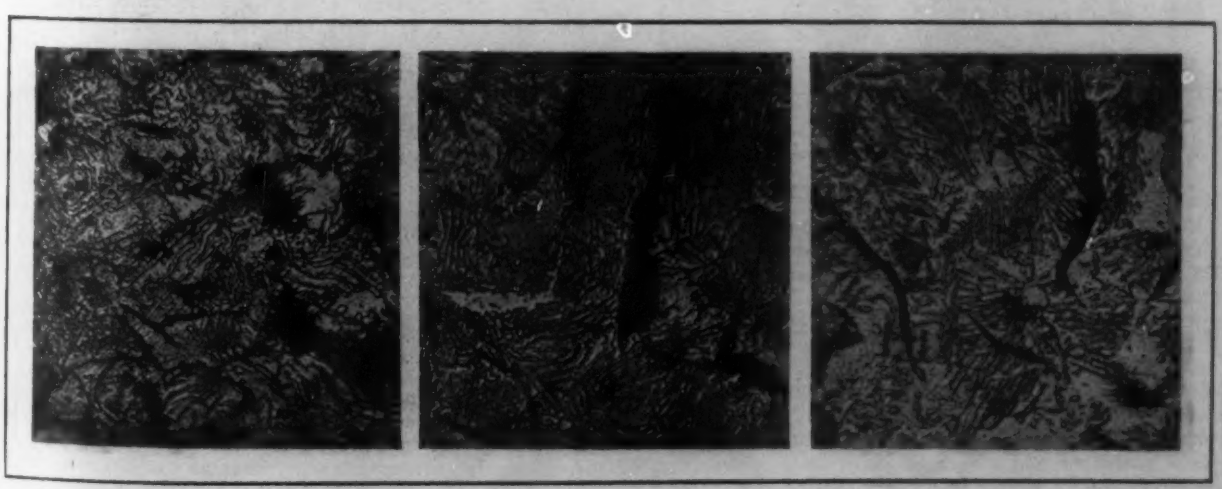
Poor's Manual of Railroads gives the total number of freight cars in service in 1890 as 1,061,970, which at the rate of eight wheels per car would make the total number of chilled wheels in use at that time 8,495,760. The same authority gives the number of freight cars in use in 1905 as 1,757,105, making the total number of wheels 14,056,840. The total number of freight cars in use in 1910 was 2,297,620, making the total number of wheels in use 18,380,960.

All other classes of equipment, locomotives, passenger cars, mail and express cars are given in the Manual as follows, for the three periods mentioned:

Year	Locomotives	Pass. Cars	Bagg., Mail, Exp.
1890	32,241	22,956	7,258
1905	46,616	30,777	11,295
1910	63,030	37,985	*13,173

*1909.

Thus it may seem that the total equipment outside of freight cars at present amounts to about 114,000 in round numbers, which makes the total number of wheels under



Figs. 6, 7 and 8—Micrographs in B Wheel. Magnification, 730 Diameters

such equipment about 900,000, as compared with about 20,000,000 freight car wheels in use at present, allowing for the increase in 1911.

It is evident that the chilled wheel is the dominant factor in wheel service. In a recent issue of *The Iron Age* the Carnegie Steel Company gave the total number of rolled steel wheels in use as 450,000. As there are a great

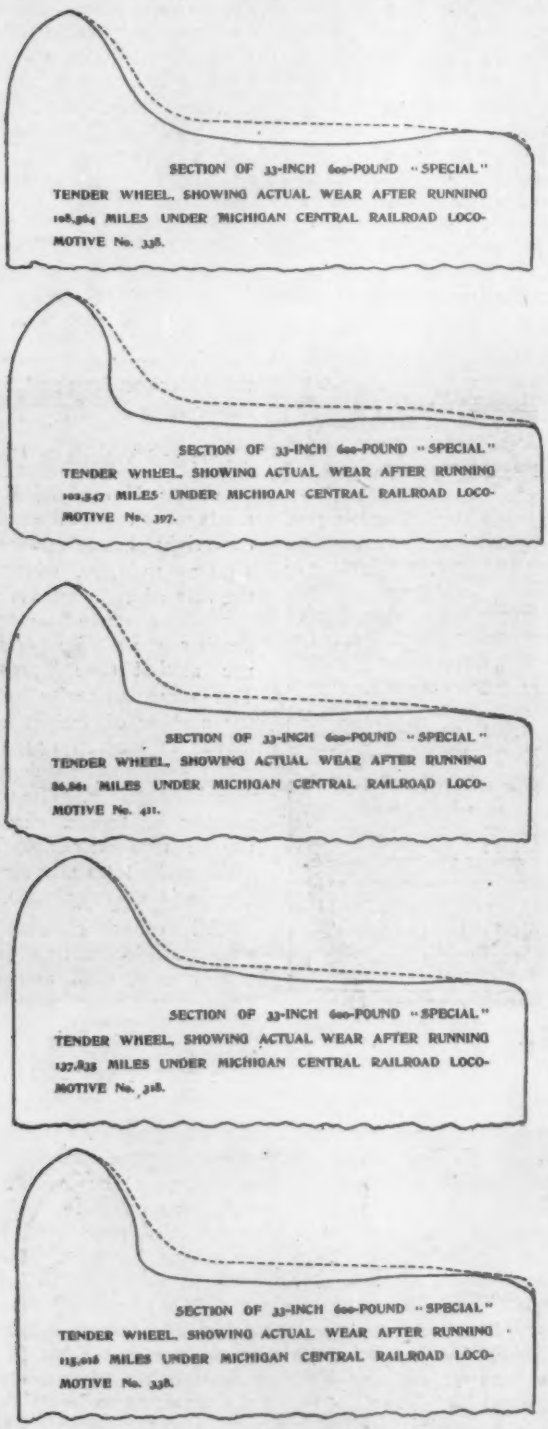

SECTION OF 33-INCH 600-POUND "SPECIAL" TENDER WHEEL, SHOWING ACTUAL WEAR AFTER RUNNING 108,964 MILES UNDER MICHIGAN CENTRAL RAILROAD LOCOMOTIVE No. 338.
SECTION OF 33-INCH 600-POUND "SPECIAL" TENDER WHEEL, SHOWING ACTUAL WEAR AFTER RUNNING 109,847 MILES UNDER MICHIGAN CENTRAL RAILROAD LOCOMOTIVE No. 397.
SECTION OF 33-INCH 600-POUND "SPECIAL" TENDER WHEEL, SHOWING ACTUAL WEAR AFTER RUNNING 86,861 MILES UNDER MICHIGAN CENTRAL RAILROAD LOCOMOTIVE No. 421.
SECTION OF 33-INCH 600-POUND "SPECIAL" TENDER WHEEL, SHOWING ACTUAL WEAR AFTER RUNNING 127,833 MILES UNDER MICHIGAN CENTRAL RAILROAD LOCOMOTIVE No. 318.
SECTION OF 33-INCH 600-POUND "SPECIAL" TENDER WHEEL, SHOWING ACTUAL WEAR AFTER RUNNING 115,016 MILES UNDER MICHIGAN CENTRAL RAILROAD LOCOMOTIVE No. 338.

Fig. 9—Actual Wear on Tread and Flange of Five Wheels Made from High Grade Charcoal Iron

many chilled wheels in use under freight locomotives and light passenger and other equipment, it is evident that 95 per cent. of all wheels in use are still of the chilled type and that such wheels must remain the leading type for many years.

Efforts to Insure Better Chilled Wheels

There has been much discussion of the quality and service of chilled wheels for a number of years and particularly since the introduction of cars of 40 and 50 tons capacity. This discussion has been confined practically to the assertion on the part of railroad officials that the quality of wheel now in service was not equal to the needs of heavy service, and to various statements from makers or committees representing makers of chilled wheels, that seemed more calculated to answer the assertions of the railroad officials than to indicate the means by which better wheels could be made.

With no disposition to join in any arguments on the subject, but for the benefit of all concerned, the Lake Superior Iron & Chemical Company in the past two years has made a comprehensive study of the whole question of quality of charcoal iron. Particular attention was given to the differences between products of such iron and those made from mixtures of coke iron or non-chilling metal, for which an apparent chilling effect similar to that from charcoal iron is obtained by the introduction of steel scrap and ferro-manganese into the non-chilling iron mixtures. Work is being carried on in thoroughly equipped laboratories at five of the company's furnaces.

Apparatus for taking physical tests is also used. Complete analyses, including carbon determinations, are made for every cast. This work is in charge of men of long experience, some of them standing high in the ranks of authorities on the metallurgy of iron. So satisfactory have the developments of this work been in the past two years that it has caused the remodeling of several of the company's blast furnaces along lines that include the best of the former practice in the making of high grade charcoal iron and all of the improvements that modern practice has developed.

It would not be fitting here to go into details of the developments that have resulted, but as they are of great importance in the production of high-grade products it is well for the makers of such material to know in general what has been done in this direction.

Attention has been given to the study of iron used in the manufacture of wheels made in the period when charcoal iron of the best quality was used, compared with specimens of the wheels made from mixtures used in the period of minimum prices above referred to. Most interesting evidence of the great difference in charcoal iron and non-charcoal iron mixtures has been brought to light by these investigations.

Comparison of a Charcoal Iron with a Coke Iron Wheel

Many photomicrographs have been made and surprising conclusions are to be drawn from them. Experience has shown that in ordinary cast irons the most information was given by a micrograph of about seventy diameters. Micrographs of these diameters were accordingly taken of two wheels, one of which, A, was known in practice to be good and to have had its parentage in charcoal iron of established reputation. The other, B, was an ordinary cast iron wheel of poor quality made within the last few years, of whose parent metal little good can be said. One had had a life of nearly ten years, the other of two or three. Fig. 1 is the good wheel; Fig. 5 is the poor one. The section examined was taken from a corresponding part in the edge of the gray in each wheel. Complete analyses were also made as follows:

Analyses of Two Wheels, One of Charcoal Iron and the Other of Coke Iron

	A wheel	B wheel
Silicon	0.73	0.73
Phosphorus	0.32	0.39
Manganese	0.46	0.48
Sulphur	0.12	0.14
Total carbon	3.16	3.10
Graphite carbon	2.70	2.60
Combined carbon	0.46	0.50

It must be confessed there is nothing in these analyses nor on these photographs to indicate the difference which the test of use had proved to exist between the wheels. Accordingly micrograms were made at 500 diameters, and as these cover so small an area it is desirable to group them so as to get the effect of an area large enough to be representative. Figs. 2, 3 and 4 constitute such a group for the A wheel, while Figs. 6, 7 and 8 are a similar group showing the structure of the B wheel. [The original magnification is reduced to 330 diameters in the making of the half-tone cuts.—EDITOR.]

The vast inferiority of the B wheel to the A wheel will be so obvious to those even moderately familiar with metallography as to need no further comment in an article of this kind.

It cannot be amiss, however, to call attention to the vastly finer grain size of the A wheel than that of the B, the coarseness distinctive of the latter being associated in the mind of every metal worker from the molder and the blacksmith to the trained metallurgist, with the idea of inferiority in endurance and all the other qualities which are really fundamental.

Micrographs have also been made of the chilled portion of the same and other wheels, but this structure is so different that to explain the superiority of the charcoal iron wheels would involve a mass of technicalities out of place here. The black cleavage lines in the chilled parts of the tread, from which both specimens were taken, indicate the weakness of the structure of the wheel made from the low-grade mixtures used in later years, this wheel having been made since 1905. The homogeneous and solid metal in the wheel made from charcoal iron mixtures was indicated even by the chilled metal without magnification. The chilled crystalline structure was fine and needle-like, free from coarse crystallization and any indication of cleavage. This wheel was made about 20 years ago by a wheel manufacturing concern in Connecticut, which also manufactured high-grade charcoal iron. The deductions that can be made in this case are illuminating.

Fig. 10—Close Grained No. 2 Iron

Fig. 11—Open Grained No. 2 Iron

Exceptional Tread and Flange Wear

Fig. 9 shows the actual wear on tread and flange of five wheels made from high-grade charcoal iron, which were used under 100-ton passenger locomotives between 1890 and 1895. The high mileage of these wheels should be noted. Out of one record of 300 of such wheels, including the mileage of every wheel removed, the average mileage was over 70,000. Out of the same record 250 wheels averaged over 100,000 miles. Seventy of the wheels were good for further service when removed, and were put back in other service. The actual wear on the five sections shown was less than an average of ¼ in.

A test of this metal for hardness taken at the time by an outside concern having apparatus to test chrome steel used for safes gave the following result: In a drilling test made with steel drills ⅝ in. diameter, hardened in brine so that it would not scratch glass, and with drilling machine constructed so that a pressure of from three to five tons could be brought to bear on the drill, two drills were blunted after each one was used 10½ minutes, without making any impression upon the section of chilled wheel tested except to cause a slight polished mark.

In the records of the American Railway Master Mechanics' Association the report of a committee appointed to report on the "Relative Merits of Cast Iron and Steel Tired Wheels for Locomotive and Passenger Car Equipment," gave the following among other records of wheel service:

Statement of Chicago, Milwaukee & St. Paul Railway Company, showing average mileage of cast-iron wheels, 33 in. diameter, removed from locomotive tenders in years 1894 *to* 1898, *inclusive.*

Year 1894, wheels removed, 2,719; average mileage, 78,770
Year 1895, wheels removed, 2,089; average mileage, 75,980
Year 1896, wheels removed, 2,276; average mileage, 82,464
Year 1897, wheels removed, 2,196; average mileage, 78,174
Year 1898, wheels removed, 2,741; average mileage, 86,793

These removals included all wheels taken out for every cause, including "slid flat." While it is true that the load on chilled wheels used 15 or 20 years ago was not as great as it is now, the mileage records given are all for locomotive service, especially for engine tender service, long known to be the most arduous kind of service as to load and breaking hardship.

Effect of Heavier Loads on Chilled Wheels

Investigation is being made also concerning the effect of the increase in load on chilled wheel service. It has been pointed out that removals of chilled wheels on account of "slid flat" have decreased to very low limits in 50-ton car service for the reason that the load point has passed the limit where the brake application can stop and slide wheels as readily. It has also been shown that the increase in the number of freight cars equipped with air brakes in late years under Federal requirements has distributed the braking force over a larger number of cars and reduced extreme applications on a few cars as formerly.

We are told that the change in this respect is plainly evident on examination of wheels removed from 50-ton car service, and that a like reduction has taken place in "shelled out" wheels, a removal originating as to its cause in brake service which results in "slid flat" wheels. It is stated also that the removals from 50-ton car service for rapid flange wear or "sharp flange" have increased heavily. This would be accounted for beyond question if the hardness of the small section of metal at the throat of the flange and tread had decreased.

Cracking of chilled surface of tread and flange have become serious causes of accidents, it is said, and the resistance of high sulphur metal in the present wheel, making the metal "red short" or weak when hot, will readily account for this defect.

Salient Points in the Wheel Situation

Many other very interesting developments of the subject have been brought to light, but the points that appear of most importance may be stated in brief as follows:

At the present price basis established by the M. C. B.

rules, the chilled wheel makers can do little more than recast old wheels into new ones or use metal of no better grade.

The average life of chilled wheels has fallen to about half of what it was 15 years ago, if the statements made are correct, at least so far as heavy equipment service is concerned.

The lack of hardness of the non-chilling coke iron mixture is sure to lead to more rapid wear, and the high sulphur content in the present wheel is sure to produce more rapid cracking of tread and flange.

Whatever the railroads may expect the wheel makers to produce at the present basis of M. C. B. prices, it is certain that wheels cannot be made out of good material at that price.

It would seem very important to recognize facts of this kind and to return to the use of material that did give satisfactory service. Nothing can be gained in any way by railroads from the use of a short life, low-grade chilled wheel.

At ½ cent per lb. net, the average price, a 725-lb. wheel for 50-ton car service costs $3.62. If it averages 30,000 miles of life the cost is 12c. per thousand miles. On the basis of the M. C. B. price, when charcoal chilling iron was used, or about 1c. per lb. net at the cost of a new wheel, a life of 60,000 miles would cost no more, and as the value of the charcoal iron wheel as scrap would exceed the scrap value of the present wheel, it is likely that the mileage cost would be lower.

The car wheel question will have to be dealt with sooner or later, and it is in some respects more serious than the rail question.

Every railroad protects itself by the quality of rails it buys for its own use. But every railroad is at the mercy of the quality of wheel under any car that passes over its line. The writer believes there is a growing interest in the making of better chilled wheels, and his company proposes to do its part in helping the movement on.

Chemical Analysis and Physical Properties

There is one point in Mr. Whitney's article to which decided exception must be taken. He implies and assumes throughout that the physical properties of an iron are dependent on its chemical analysis. The one fact which recent investigations and experience have demonstrated beyond peradventure is that the physical qualities of an iron do not depend on its chemical analysis. That there is a general variation in certain qualities, corresponding with a general variation in analysis, is admitted, but it has been found not once but many times that two irons of identical analyses made in the same furnace, from the same ore mixture, can have vastly different physical properties.

This point is so important that I think it well to give one proof out of the many that could be offered in support of our contention. Herewith are given the analysis, breaking strength and photomicrographs of two irons, which we will distinguish as close grained No. 2 and open grained No. 2. These, as above stated, were made in the same furnace and with the same ore and fuel.

	Close Grained, No. 2	Open Grained, No. 2
Silicon	1.00%	1.10%
Manganese	.38	.53
Phosphorus	.112	.116
Sulphur	.009	.023
G. C.	2.72	3.16
T. C.	3.71	3.84
C. C.	.99	.68

Breaking strength of 1¼-in. round pins on 12-in. centers:

4,950 lb.	2,750 lb.
4,500 lb.	2,700 lb.
4,300 lb.	2,700 lb.
	2,750 lb.

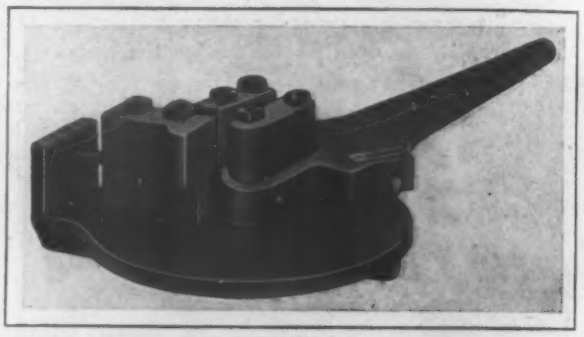
The photomicrographs shown in Figs. 10 and 11 supply almost at a glance a confirmation of these physical results. The structure of the open-grained iron is very coarse, with long slender slices of graphite interrupting its continuity in all directions. The other iron is of close structure and the graphite tends to exist in pools or patches isolated from one another, thus leaving the continuity almost uninterrupted.

Greater contrasts than this could have been obtained, but it would seem that those who consider the evidence with an open mind will accept this as a satisfactory proof. The above is no denial of the utility of analysis for many purposes, nevertheless nothing but error can come from accepting it as the only guide in matters of this kind.

Hand Power U Bender

For making stirrups for reinforced concrete work as well as other forms of U bends in general manufacturing, a powerful machine capable of being operated by one man is being offered by the Wallace Supply Company, 108 North Jefferson street, Chicago, Ill. It is designed especially to handle heavy stock, and will bend ⅜-in. square twisted bars easily. It is also possible to bend round stock on this machine, and by substituting separate forming dies it is possible to handle larger sizes of stock. The jaws or dies can be easily set to suit the various sizes.

The power is obtained from the lever at the right, to which a handle can be fastened by bolts. Thus the radial member carrying the bending jaws is turned through a sufficient angle to produce the required bend. This machine, which is known as the No. 2 U-bending tool, is a development from long experience in the manufacture of all kinds of bending tools. In addition the company



A New Type of Hand Power Machine for Making U Bends in Round and Twisted Bars Made by the Wallace Supply Company, Chicago, Ill.

builds an extensive line of bar benders for forming bars into various angles, hooks, etc., and one of these, the No. 5 power angle bender, was illustrated in *The Iron Age*, March 30, 1911. All parts of the new machine are very strong and the lever is fitted with anti-friction rollers, while all the dies have tool steel face plates at the corners. This machine will make bends ranging from 1 to 8 in. between the legs of the U. Among the pieces turned out by this machine are a series of U's from ⅜-in. square twisted high carbon steel, a 3-in. U in ¾-in. round mild steel stock and 1½-in. U and angle bends in ¾-in. round mild steel bars.

Southwark Foundry Under New Control

The majority interest in the stock of the Southwark Foundry & Machine Company, Philadelphia, Pa., has been acquired by persons identified with the Baldwin Locomotive Works. The following board of directors was elected May 7: Alba B. Johnson, Samuel M. Vauclain, H. DeHaven Bright, John P. Sykes, R. K. Johnson, J. L. Vauclain and Andrew Vauclain. The new officers are: President, H. DeHaven Bright; vice-president and treasurer, James H. Maloney; secretary, Alfred C. Maule. Mr. Johnson states that the purchase of this interest by persons represented in the Baldwin Locomotive Works does not mean that the latter company has taken over the Southwark Foundry & Machine Company. The transaction, he further states, was an individual enterprise and the company will continue to manufacture its line of engines and machinery as heretofore.

The stockholders of Henry Disston & Sons, Inc., Philadelphia, Pa., will vote July 9 on increasing the capital stock from $1,250,000 to $1,500,000 in order to provide for the construction of a new steel plant.

Geared Steam Turbine for the Rolling Mill

Turbine at Calderbank Steel Works, Scotland, Connected to Mill Through Two Sets of Reducing Gears and Using Live and Exhaust Steam

Some months ago a paper was read before the West of Scotland Iron and Steel Institute by A. Q. Carnegie on the application of a mixed pressure steam turbine direct geared to the driving of a rolling mill. The mill is for rolling plate and is three-high with rolls 28 in. in diameter by 84 in. long. It is at the Calderbank Steel Works of James Dunlop & Co. It was first proposed to use exhaust steam from the existing mill engines for electrically driving the new mill, and to use a large flywheel, already present, to equalize the load on the dynamo and motor.

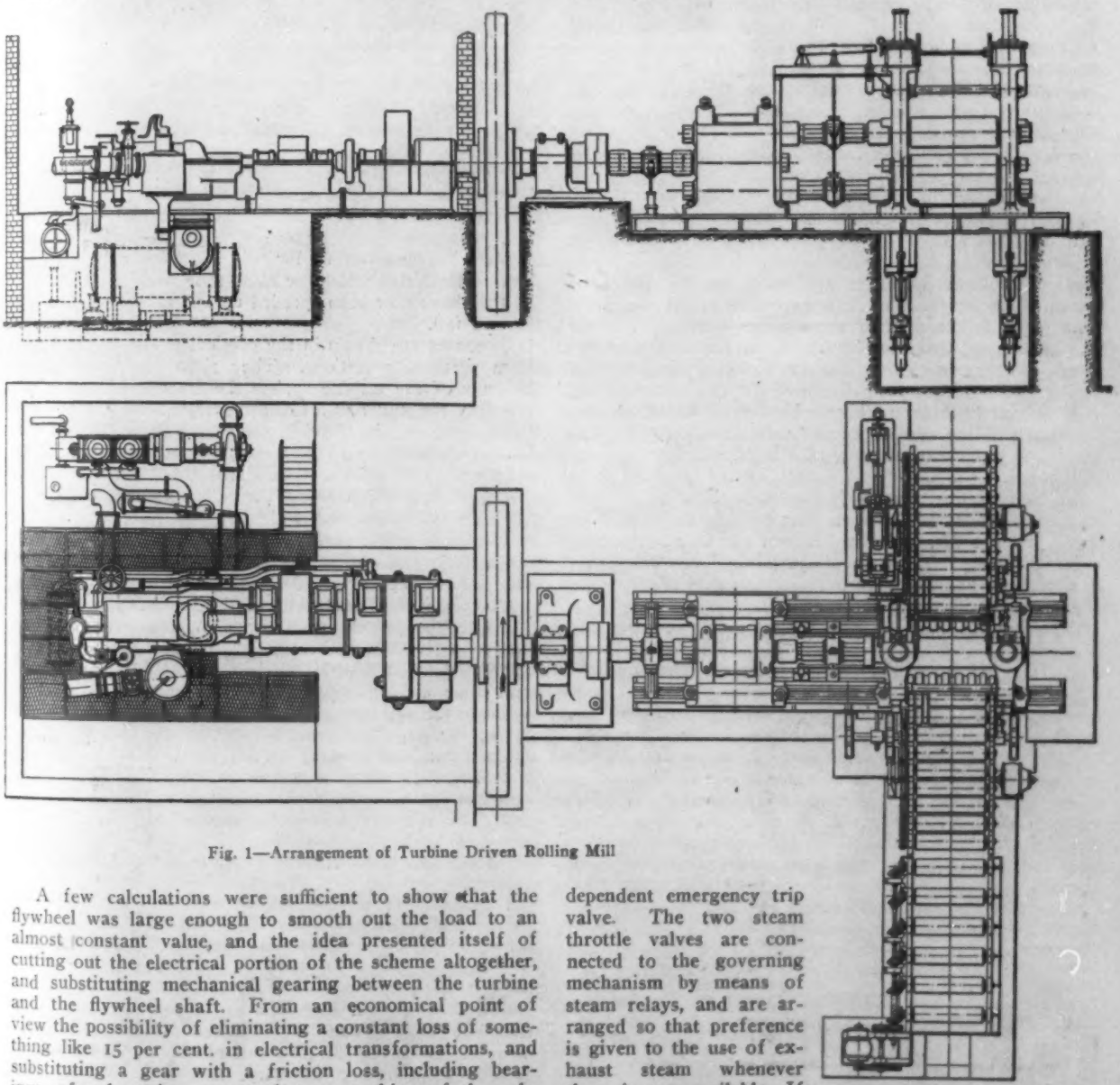


Fig. 1—Arrangement of Turbine Driven Rolling Mill

A few calculations were sufficient to show that the flywheel was large enough to smooth out the load to an almost constant value, and the idea presented itself of cutting out the electrical portion of the scheme altogether, and substituting mechanical gearing between the turbine and the flywheel shaft. From an economical point of view the possibility of eliminating a constant loss of something like 15 per cent. in electrical transformations, and substituting a gear with a friction loss, including bearings, of only 1½ per cent. (to say nothing of the substantial saving in capital expenditure) was very tempting; and after very careful consideration the experiment was decided upon.

In order to lessen the risk the plant was designed so that in the event of the high-speed gear proving a failure, a dynamo could be fitted in its place and the mill driven electrically as in the original scheme. The second reduction gear was an ordinary commercial proposition, and involved nothing in the way of experiment, so that it could be worked in any case. Fig. 1 shows the general arrangement in elevation and plan. The table rolls and the screw down are electrically driven, and the lifting tables are driven hydraulically.

The steam turbine is a Parsons mixed pressure type, designed to run at 2000 r.p.m., either with exhaust steam at a pressure of 16 lb. per square inch absolute, or with live steam direct from the boilers at a pressure of 60 lb. per square inch above atmosphere. The turbine is provided with two steam inlets, one being at the high pressure end, and the other about the centre of the cylinder. Each inlet is provided with a steam chest containing a double beat balanced throttle valve, and an independent emergency trip valve. The two steam throttle valves are connected to the governing mechanism by means of steam relays, and are arranged so that preference is given to the use of exhaust steam whenever there is any available. If this exhaust steam supply is insufficient, or if it ceases altogether, the balance of power required is supplied by the high pressure valve quite automatically, the distribution of the load between high pressure and exhaust steam being effected by the decrease in speed. In addition to these valves there is a small device which causes the low-pressure throttle to close whenever the exhaust steam receiver pressure falls to nearly atmospheric pressure. This is necessary in order to prevent air from being drawn in when there is a shortage of exhaust steam.

The blading is of the usual Parsons reaction type, and

the areas are proportioned so that when working at full load with exhaust steam there is atmospheric pressure at the first row of low pressure blades. The high pressure blades are running idly in steam at atmospheric pressure. When the whole load is taken over by high-pressure steam, the pressure at the first row of low-pressure blades falls to about 8 lb. absolute, so that the smaller quantity of steam is still able to fill the blades and maintain an efficient velocity ratio. In this way it is possible to obtain full efficiency on either live or exhaust steam. The full power of the turbine is available from either source of steam supply, or from any desired mixture of the two.

The power required for the turbine was gone into very carefully, and the figure decided upon was 750 b. h. p. This power has been found ample in practice. The mill runs at a speed of 70 r.p.m., and the speed of the turbine is reduced from 2000 r.p.m. in two steps, the intermediate shaft running at about 375 r.p.m. The high speed pinion is formed solid with its shaft, and is made of forged chrome nickel steel. The pitch line diameter is 7.143 in., and there are 25 teeth with 3½ in. diametrical pitch. The wheel into which it gears has 131 teeth, and has a 37.429 in. pitch diameter, with a total face width of 24 in.

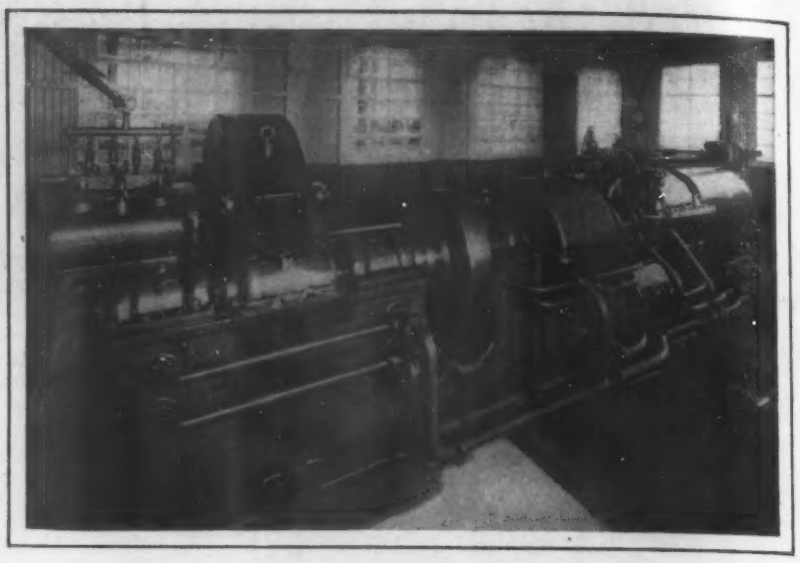


Fig. 3—View of Turbine and Gear Boxes in Engine Room

The second reduction gear has a forged mild steel pinion, with 23 teeth of 2 in. circular pitch; the pitch diameter is 14.912 in.; and it gears into a wheel of 80.848 in. diameter with 127 teeth. The total face width of the low speed gear is 16 in. The double helical teeth are at an angle of 23 deg. with the axis of the shaft, and are cut in a special hobbing machine which automatically generates teeth of the correct shape. Gears made in this way are found capable of running at a high velocity with very little noise.

A plan of this gearing is shown in Fig. 2. Flexible couplings are fitted between the turbine and the high speed pinion shaft, and also between the first and second reduction gears. These couplings allow for small errors in alignment, and also give the necessary end freedom for expansion of the steam turbine shaft.

The flywheel with its shaft weighs nearly 100 tons and is carried on two 22-in. diameter adjustable bronze bearings. The low speed gear wheel is keyed directly to the end of the flywheel shaft and is overhung from its bearing. The flywheel is of cast iron, built in two portions, which are fastened together in the usual way. The sides of the rim are turned true so as to form the track for a pair of hydraulic brakes, which enable the whole plant to be brought to rest in 25 sec. in case of emergency. The external diameter of the wheel is 23 ft. The energy stored in the flywheel is about 20 times that of the turbine and gears, so that the latter can get only a small fraction of the shock coming on the mill rolls.

The first slab was put through the mill September 15, 1910, after the whole plant had been run slowly for several days to allow the main bearings to settle down into working order. Mr. Carnegie was in the turbine room at the time, but was not aware that rolling had been started until the slab had made six or seven passes. Up to 30 slabs have been rolled in an hour and the maximum size of plate has been 60 ft. long by 6 ft. wide by 3/16 in. thick. The lifting tables for some time worked too slowly, but they have now been speeded up and take 6 sec. for the lift and fall.

Diagrams are shown in the original paper of speed and steam pressure variations. They show how quickly the governor of the turbine applies the amount of power required by the mill and also how energy stored in the flywheel equalizes the driving power. The weight of the slab being rolled was 1590 lb., its original thickness 4 in. and the finished plate 0.31 in. The power exerted by the turbine during the heaviest period of rolling was about 556 b.h.p. The finished width of the plate was 63 in. During the heaviest passes shown in the diagram the mill was using up power at the rate of about 2500 hp., but records have been obtained showing that as much as 4000 to 5000 hp. were being absorbed during heavy passes.

Up to the present time the plant has been working mostly on live steam, because there has been very little exhaust steam available. When business is sufficiently brisk there will be sufficient exhaust steam from the mills to enable the turbine to run with only an occasional whiff of live steam. The general experience which has been obtained with the working of this plant is sufficient to show that the experiment has proved a most gratifying success. The mill has been working regularly ever since the heavy bearings settled down into good working order and no trouble of any sort has occurred. The gears show no appreciable wear.

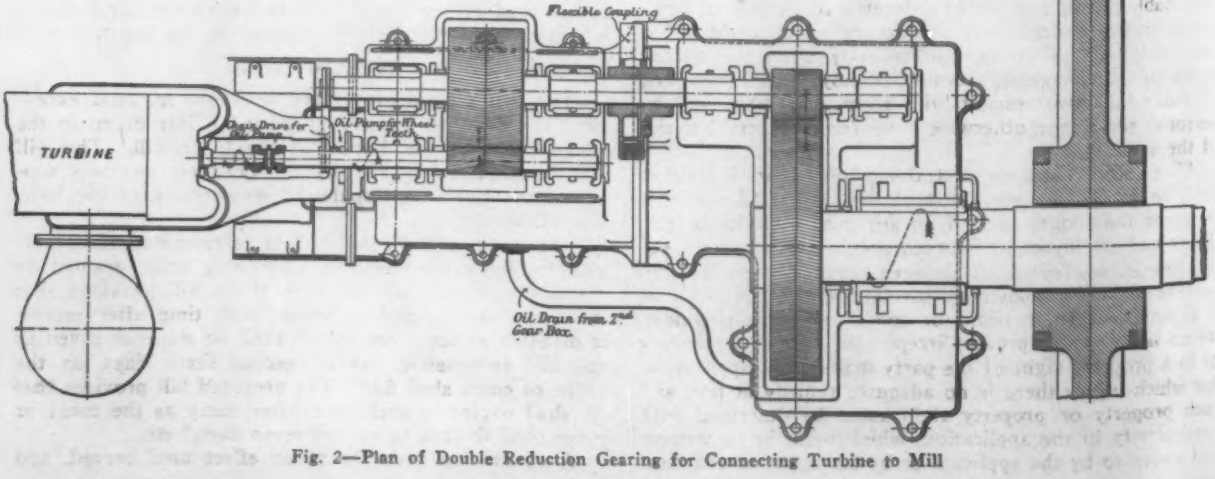


Fig. 2—Plan of Double Reduction Gearing for Connecting Turbine to Mill

A Sweeping Anti-Injunction Bill

A Bill Which Is Intended to Meet the Fondest Hopes of Labor Agitators

Below will be found the full text of the anti-injunction bill (H. R. No. 23, 635) favorably reported to the National House of Representatives April 29 by Chairman Clayton, of the Judiciary Committee, and following it are given extracts from a minority report by members of the same committee, whose spokesman was Mr. Moon, of Pennsylvania.

The Clayton Anti-Injunction Bill

A bill to amend an act entitled "An act to codify, revise and amend the laws relating to the judiciary," approved March 3, 1911.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that section 263 of the act entitled "An act to codify, revise and amend the laws relating to the judiciary" approved March 3, 1911, be, and the same is hereby, amended so as to read as follows, and that said act be further amended by inserting after section 266 thereof three new sections, to be numbered, respectively, 266a, 266b and 266c, reading as follows:

"Sec. 263. That no injunction, whether interlocutory or permanent, in cases other than those described in section 266 of this title, shall be issued without previous notice and an opportunity to be heard on behalf of the parties to be enjoined, which notice, together with a copy of the bill of complaint or other pleading upon which the application for such injunction will be based, shall be served upon the parties sought to be enjoined a reasonable time in advance of such application. But if it shall appear to the satisfaction of the court or judge that immediate and irreparable injury is likely to ensue to the complainant, and that the giving of notice of the application or the delay incident thereto would probably permit the doing of the act sought to be restrained before notice could be served or hearing had thereon, the court or judge may, in his discretion, issue a temporary restraining order without notice. Every such order shall be indorsed with the date and hour of issuance, shall be forthwith entered of record, shall define the injury and state why it is irreparable and why the order was granted without notice, and shall by its terms expire within such time after entry, not to exceed seven days, as the court or judge may fix, unless within the time so fixed the order is extended or renewed for a like period, after notice to those previously served, if any, and for good cause shown, and the reasons for such extension shall be entered of record.

"Sec. 266a. That no restraining order or interlocutory order of injunction shall issue except upon the giving of security by the applicant in such sum as the court or judge may deem proper, conditioned upon the payment of such costs and damages as may be incurred or suffered by any party who may be found to have been wrongfully enjoined or restrained thereby.

"Sec. 266b. That every order of injunction or restraining order shall set forth the reasons for the issuance of the same, shall be specific in terms and shall describe in reasonable detail, and not by reference to the bill of complaint or other document, the act or acts sought to be restrained; and shall be binding only upon the parties to the suit, their agents, servants, employees and attorneys, or those in active concert with them, and who shall by personal service or otherwise have received actual notice of the same.

"Sec. 266c. That no restraining order or injunction shall be granted by any court of the United States, or a judge or the judges thereof, in any case between an employer and employees, or between employers and employees, or between employees, or between persons employed and persons seeking employment, involving or growing out of a dispute concerning terms or conditions of employment, unless necessary to prevent irreparable injury to property or to a property right of the party making the application, for which injury there is no adequate remedy at law, and such property or property right must be described with particularity in the application, which must be in writing and sworn to by the applicant or by his agent or attorney.

"And no such restraining order or injunction shall prohibit any person or persons from terminating any relation of employment, or from ceasing to perform any work or labor, or from recommending, advising or persuading others by peaceful means so to do; or from attending at or near a house or place where any person resides or works, or carries on business, or happens to be for the purpose of peacefully persuading or communicating information, or of peacefully persuading any person to work or to abstain from working; or from ceasing to patronize or to employ any party to such dispute; or from recommending, advising or persuading others by peaceful means so to do; or from paying or giving to or withholding from any persons engaged in such dispute any strike benefits or other moneys or things of value; or from peaceably assembling at any place in a lawful manner and for lawful purposes; or from doing any act or thing which might lawfully be done in the absence of such dispute by any party thereto."

Views of the Minority

According to the report of the majority of this committee, this bill intends to correct "the too ready issuance of injunctions, or the issuance without proper precautions or safeguards." If the report is predicated upon the "too ready issuance of injunctions" it is singular that it does not disclose a single case upon which the opinion of the majority could be founded. We are well aware of the charges iterated and reiterated before Congressional committees alleging abuses in the issuance of injunctions. We have not found any more evidence to support them in the past than we now find in the report of the committee. We thoroughly believe, with the Supreme Court of the United States, "that no injunction ought to be granted except in a case reasonably free from doubt. We think such rule is and will be followed by all the judges of the Federal courts."

The minority members have at all times been willing to assent to a rational proposal to further safeguard the issuance of injunctions against even the possibility of abuse, and have introduced a bill for that purpose; but we cannot consent to proposals which would operate to deprive the writ of half its efficiency in all cases and to determine its application in many instances by the character of the parties to the controversy rather than the nature of the wrong which is to be remedied. We think, furthermore, that the majority report is founded upon a misconception of the course of judicial decision respecting statutes regulating the issuance of injunctions, and that the legislation proposed is impracticable, invalid, in the interests of a class rather than of the community, and proposes standards of legality without parallel or precedent in our legislation.

The First Section

The first section of the bill, with one material exception, is almost an exact copy of a bill introduced in the Sixty-first Congress, known as the Moon bill. This bill was reintroduced in the present Congress and was supported by the entire Republican membership of the Judiciary Committee.

The exception referred to has reference to the provision for the expiration of a restraining order granted by the court without notice. The Moon bill provided that the order should expire "within such time after service is made or notice given, which shall be made or given as speedily as possible, not to exceed seven days, as the judge or court shall fix." The proposed bill provides that "it shall expire at such time after entry as the court or judge shall fix, not to exceed seven days," etc.

A restraining order is of no effect until served, and

under such a provision it would be only necessary for those having knowledge of the application to avoid service for seven days after the issuance of the order to defeat its purpose. We can conceive circumstances in which a few who might be served would notify other defendants to avoid it and on failure to make the order effective by service within seven days it would be necessary to give notice to all previously served before an extension of further time could be had. We can conceive of no more certain method of depriving a suitor of essential equitable protection. Many judicial districts of our country administer justice over vast areas in which the material circumstances of life must be taken into consideration. The proposal of this section is general. It applies to all forms of litigation, and in view of the physical as well as the personal difficulties attending the service of restraining orders under some circumstances we cannot but believe that not only would many individual suitors suffer grevious injury, but we can from our public service and professional experience conceive many circumstances in which the public interest would be seriously jeopardized. All of these difficulties would be overcome if the restraining order should date from the time of service instead of the time of its entry.

The Second Section

Section 266A provides that no restraining or interlocutory order shall issue except upon the giving of security against cost or damage.

Under the present practice this is within the discretion of the court, and while we should not be disposed to disagree with such a suggestion, we must again note that no reason is given for the suggested change which implies a failure upon the part of the courts to properly exercise this discretion. No evidence to this effect has been at any time submitted to the committee, nor do the majority offer any evidence to that effect as a reason for their action.

The Third Section

Section 266B requires every restraining order or every injunctive order "to set forth the reasons for the issuance of the same to be specific in terms and describe in reasonable detail, and not by reference to the bill of complaint or other document the act or acts sought to be restrained"; it binds only the parties to the suit, "their agents, servants, employees and attorneys or those in active concert with them, and who shall by personal services or otherwise have received actual notice of the same." This section is of general application. In support of this provision the majority point out that it is to be a safeguard against "dragnet or blanket injunctions," by which parties may be punished for contempt after "only constructive notice, equivalent in most cases to none at all."

The effect of section 266B is to abolish the many rules in equity of the Supreme Court in conflict with it, representing the professional experience of a century, and amended from time to time to shorten procedure, increase the convenience and protect the rights of litigants in the courts of the United States. The majority says section 266 does not change the best practice with respect to orders but imposes the duty upon the courts in mandatory form to conform to correct rules as already established by judicial precedent. We respectfully submit that the equity rules of the Supreme Court express correct judicial precedents and that the majority have apparently overlooked this important fact.

The bill as reported would withdraw the application of the restraining order from parties not named in it and not in agreement with the parties named who may on their own initiative undertake its violation. Such cases are not uncommon. If the majority intend to exempt such violations of the order they have created an unusual and remarkably privileged class of lawbreakers; if not, we are unable to discern the intention expressed in the limitation "in active concert with them."

The Fourth Section

The two paragraphs of section 266C must be read in connection with each other or their purpose and meaning are lost. The first paragraph provides that no judge or court of the United States shall issue any restraining order or injunction "in any case between an employer and employees, or between employers and employees, or between persons employed and persons seeking employment, involving or growing out of a dispute concerning the terms or conditions of employment, unless necessary to prevent irreparable injury to property or to a property right," etc. If this section is intended to withdraw civil rights from equitable protection in this class of cases, we must disapprove it as an evident effort to deny such protection as is given to civil rights in all other classes of cases, since it is axiomatic that it is the office of equity to protect by injunction, under proper circumstances, civil and even personal as well as property rights. We object to the implication contained in emphasizing controversies between employers and employees, or between employees or persons employed and seeking employment, and if the majority intends by this to indicate that such rights are to have less or different protection from the same rights when involving controversies of another kind we must emphatically disagree with the principle implied, for in this country remedies are to be predicated at all times upon the character of the rights which are threatened and not upon the class or nature of the persons involved in the controversy.

The second paragraph of section 266C contains to our mind the most vicious proposal of the whole bill. It enumerates certain specific acts and provides that no restraining order or injunction shall prohibit the doing of them. Most of the acts thus recited are in themselves not amenable to the injunction process under existing law and practice. No court does or would enjoin them, but to declare by law that these acts should under no circumstances be restrained, we do not hesitate to say, is a proposal without precedent in the legislative history of the country. No legislature has ever proposed that any act however innocent itself should be sanctified irrespective of the motive or purpose of the actor.

The majority undertakes to prescribe a set rule forbidding under any circumstances the enjoining of certain acts which may or may not be actuated by a malicious motive or be done for the purpose of working an unlawful injury or interfering with constitutional rights of employer or employee. In Arthur vs. Oakes (63 Fed. Rep., 310) Justice Harlan points out the impossibility of prescribing a set rule of this character and says: "The authorities all agree that a court of equity should not hesitate to use its power when the circumstances of the particular case in hand require it to be done in order to protect rights of property against irreparable damage by wrong doers. It is as Justice Story said 'because of the varying circumstances of cases that courts of equity constantly decline to lay down any rule which shall limit their power and discretion as to the particular cases in which such injunction shall be granted or withheld,'" and the authority proceeds, "there is wisdom in this course, for it is impossible to foresee all the exigencies of society which may require their aid and assistance to protect rights or redress wrongs. The jurisdiction of these courts thus operating by special injunction is manifestly indispensable for the purposes of social justice in a great variety of cases and therefore should be fostered and upheld by a steady confidence."

Among the acts which the second paragraph of section 266C declares shall not be restrained is to prohibit any person or persons to terminate any relation of employment, or from ceasing to perform any work or labor or from recommending or persuading others by peaceful means so to do; of peacefully persuading any person to work or to abstain from working, or from ceasing to patronize or employ any party to such dispute or from recommending, advising or persuading others by peaceful means so to do," etc.

While many of these acts are in themselves entirely harmless and would never be enjoined by any court, yet under certain circumstances the same acts might become a weapon of lawless and destructive industrial warfare demanding the protection of the courts. This section would prevent the issuance of the injunction in the Debs case; it would prevent the issuance of the injunction in Toledo & Ann Arbor vs. Pennsylvania Company; it would prevent the issuance of any injunction to restrain either workmen or employers who were the objects of the most vicious form of boycott that has been passed upon by the courts, or can be devised by the ingenuity of boycotters. It changes the remedies by which the Sherman act may be enforced, inasmuch as if any of these acts enumerated

in section 266 C were the means employed to enforce the restraint of trade or to damage the interstate business of any individual or corporation no injunction could be obtained either by a private individual or by the Government against such acts.

In the Toledo & Ann Arbor case the famous rule 12 of the brotherhood provided that none of its members should handle the cars of any carrier with which members of the brotherhood were in a dispute. In that case the brotherhood employees of the Pennsylvania refused to handle cars of the Toledo & Ann Arbor because of a dispute between that road and some of the brotherhood, and they threatened to quit the service of the Pennsylvania road unless it agreed to violate the provisions of the Interstate Commerce act by not affording equal facilities to the cars of another road. No violence was threatened. The brotherhood merely undertook to "peacefully persuade" the Pennsylvania not to handle the cars of another road under a threat of leaving the service—a thing which they had a perfect right to do to better their own condition, but not for the purpose of compelling the Pennsylvania Railroad to violate the law.

It is said by the majority that no question of constitutionality is involved. We submit that if the measure is to be construed, as it evidently is, to prevent the application of injunctive relief to certain acts in disputes between employer and employee which may be part of a scheme or plan to work irreparable injury, which acts could be enjoined in any other department of litigation, it is obvious that the parties affected would be denied the equal protection of the law and due process of law.

We agree with the majority that "liberty and more of it is safe in the hands of the workingmen of the country." We are convinced of the merit and truth of that contention. We do not, however, believe that liberty is advanced in the person of any citizen by stripping him of remedial protection through processes which have received the deliberate and mature approval of the English-speaking race during all the centuries of its history. We cannot believe that the due protection of person and property under constitutional guaranties and by remedies tested by time is "an impediment to progress" or that the destruction of the essential remedies by which person and property receive protection is "a great social advance." We believe with the President of the United States, in a famous statement made by him many years since to the American Bar Association, "It will not be surprising if the storm of abuse heaped upon the Federal courts and the political strength of Federal groups, whose plans of social reforms have met obstructions in these tribunals, shall lead to serious efforts, through legislation, to cut down their jurisdiction and cripple their efficiency. If this comes, then the responsibility for its effects, whether good or bad, must be not only with those who urge the change, but also with those who do not strive to resist its coming."

Financiers Inspect the Bethlehem Steel Works

Charles M. Schwab, president Bethlehem Steel Company was host May 9 to 150 prominent New York capitalists at the company's plant in South Bethlehem, Pa. The financiers represented Kuhn, Loeb & Co., Hallgarten & Co., William Salamon & Co. and Harvey Fisk & Sons, the syndicate which has underwritten the new first lien and refunding 5 per cent. $50,000,000 bond issue of the corporation, and other prominent bankers and brokers of the metropolis. The party, accompanied by Mr. Schwab and other officers of the company, was taken to South Bethlehem in a train of five Pullman cars and Mr. Schwab's private car Loretto. The financiers saw modern methods of armor plate, structural steel and open-hearth rail construction, and visited the many other departments, prior to being lunched by Mr. Schwab at his plant.

The War Department estimates the damage of Mississippi and other floods at $50,000,000. Less conservative estimates run as high as $100,000,000. Governor Sanders of Louisiana, in a dispatch to the New York Times, places the property damage in that State up to May 8 at $6,000,000, and says that if waters remain high until July the loss through failure to be able to plant will reach three times that sum. Over 375,000 persons in the State are homeless. The Governor urges the nation to protect his State from flood waters not originating there.

Workmen's Compensation in Indiana

Workmen's compensation laws formed the principal subject for consideration at the annual meeting of the Manufacturers' Bureau of Indiana, held at Indianapolis April 20. M. W. Mix, president of the bureau and head of the Dodge Mfg. Company, Mishawaka, Ind., devoted much of his annual address to a discussion of the subject.

"With a development of the workmen's compensation idea, the abolishment of the three principal defenses in employer's liability cases," he said, "the need of education in these subjects will be more and more keenly felt by the smaller establishments, and more interest will necessarily be taken in a State organization." He recounted the work of the legislative committee at the last session of the Legislature, stating that if any tangible advantage had accrued to those for whose benefit the employers' liability law was passed it has not been so demonstrated, with the possible exception that claims are more speedily settled, but not to any greater net cost to the liability insurance company.

Continuing, Mr. Mix said: "A bill was introduced to provide for a system of workmen's compensations for injuries, but the Governor and others became convinced that such a bill would be declared unconstitutional, and it was not reported out of the committee. However, in his plan for a new constitution, it is provided that such a bill may be passed, and I am firmly convinced that we will eventually have such an act in Indiana as is now effective in Illinois, Wisconsin and a number of other prominent manufacturing states. The idea that the various industries should provide for the accidents and diseases due to their respective lines, the expense thereof to be considered as a part of the manufacturing cost, seems to be taking firm root in the minds of our people. All employers, large or small, should study the question thoroughly and be prepared to discuss it with legislators and with their employees, to the end that precipitate, unfair measures be not passed. The effect of these laws on manufacturers who have local State compensation acts, and who must compete with manufacturers of other States where such acts are not in force, is very serious, and it will eventually lead to such laws being passed in all States. To anticipate this all manufacturers should confer for the purpose of developing uniform laws in the various States and eliminating the unfair burdens that are likely to be imposed through lack of co-operation."

Collapsible Hand-Rails on Panama Lock Gates

One of the most interesting features in connection with the operations of the locks on the Panama Canal is the mechanism that controls the collapsible hand-rails on the top of the various gates, 40 in number. When these gates are closed, a standing rail on each side serves to prevent the walker from falling into the water. As the gates are opened to admit the passage of a vessel, these rails are automatically collapsed or folded by means of a unique driving mechanism operated by motor. The worms, gears and screws for this device present some very noteworthy engineering features. All parts are, as a matter of fact, exceptionally heavy, while the design of the entire outfit has been made with a view to quick operation and accessibility. There are 80 sets—40 right hand and 40 left hand. Each gate is approximately 70 ft. in length, and some idea of the rugged construction necessary can be gained from this figure. The contract for the production of these mechanisms was recently awarded to the Earle Gear & Machine Company, Stenton and Wyoming avenues, Philadelphia, which is a specialist in the manufacture of work of this character, having recently produced a large number of the lock operating mechanisms for the New York State Barge Canal.

The Evelyn, a steamship built for Puerto Rican freight service and owned by the A. H. Bull Steamship Company, was launched May 10 in the yards of the Newport News Ship Building & Dry Dock Company. The Evelyn is 320 ft. over all and has 46 ft. beam. Modern in every respect, the new steamship has a dead weight capacity of 5100 tons. The Carolyn, a sister steamship, will be launched next month.

The Farrow Spike Machine

Interesting Details of an Improved Automatic Type

Improvements have been recently made by the Mechanical Equipment Company of Canada, Ltd., 645 St. Lawrence Boulevard, Montreal, Canada, in the Farrow patented automatic railroad spike machine. A brief description of the original machine was given in the New Tools and Appliances column of *The Iron Age* May 12, 1910. This machine was especially designed to meet the requirements of a modern spike plant, and is said to have embodied in it features which overcome the various difficulties encountered in the operation of other spike machines now in general use. Among the special advantages of this machine are that each part is driven independently from the main shaft by eccentrics and cams so that the motion of any one part can be altered without interfering with any other part. This, it is emphasized, was not possible in the older type of machines, which are so constructed that the time of any one part cannot be altered without changing the whole motion of the machine. Another advantage of this new arrangement is that the machine can be operated at a considerably higher speed. The Swett principle, which is the one generally employed, has been embodied in the design. This principle consists of feed pointing rolls to deliver and cut off the blanks, nippers to deliver the blank to the die, a griping lever to hold the blank and a header to forge the head. As compared with that type of machine, the Farrow machine has a straight line motion and is directly and independently operated from the main shaft, while in the old type it is pointed out that the motion is of the seesaw variety, each motion being dependent upon the others with a multiplicity of parts. The operating side of this new machine is illustrated in Fig. 1, while an elevation and a plan view giving details of its construction are reproduced in Figs. 2 and 3, respectively. Fig. 4 is a rear view of the machine.

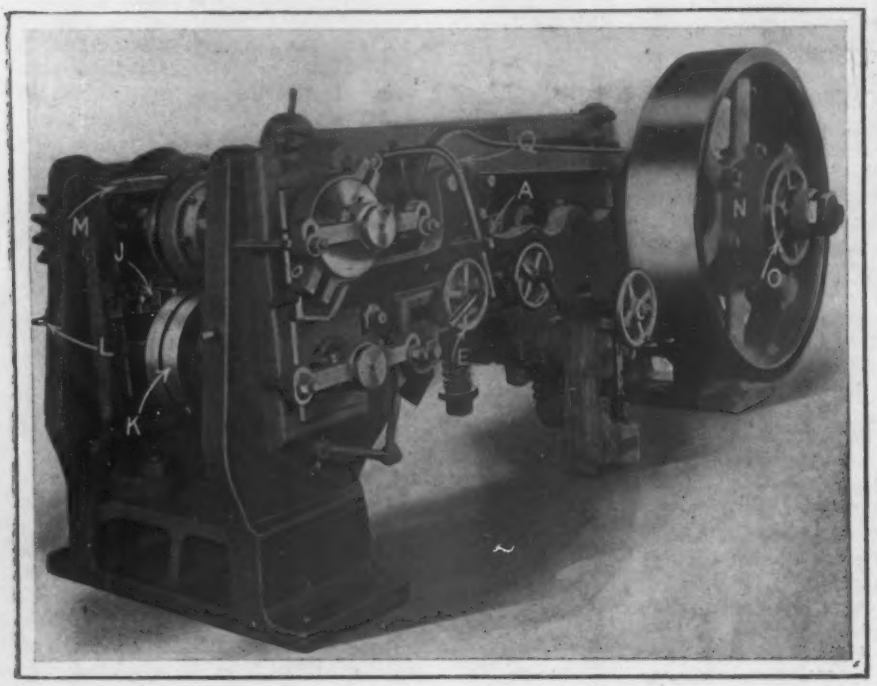


Fig. 1—Operating Side of a New Automatic Spike Machine Built by the Mechanical Equipment Company of Canada, Ltd., Montreal, Canada

The Farrow machine is constructed mainly without rockers or keys, which, it is emphasized, are a cause of trouble, since they develop lost motion and throw the machine out of gear. The machine has a specially designed motion which, by heading the spike with a horizontal blow, produces a neck having equal reinforcements on the throat and back of the neck of the spike in accordance with standard specifications. If desired the reinforcement can be thrown either entirely on the throat or on the back of the neck. The header A, Figs. 1 and 4, is driven from a crank on the main shaft *a*, Fig. 3, to the crank shaft *b*, Figs. 2 and 3, coupled in the heading rocker *c* by a rocker pin, *d*, to the heading bar *e*. This bar is swung by a positive and simple heading link arrangement which is shown in Fig. 2 at the point *f*.

The construction of the nippers is also different from that now in use. It is emphasized that this construction accounts largely for the uniformity of the product of this machine. The nippers are also easily accessible and efficiently operated. Referring to Figs. 2 and 3, it will be noticed that the nipper mechanism is driven independently and directly from the main shaft by an eccentric strap, *g*, coupled to the eccentric rod *h*. From here power is transmitted to the nipper regulator rocker *i*, C, Fig. 4, which

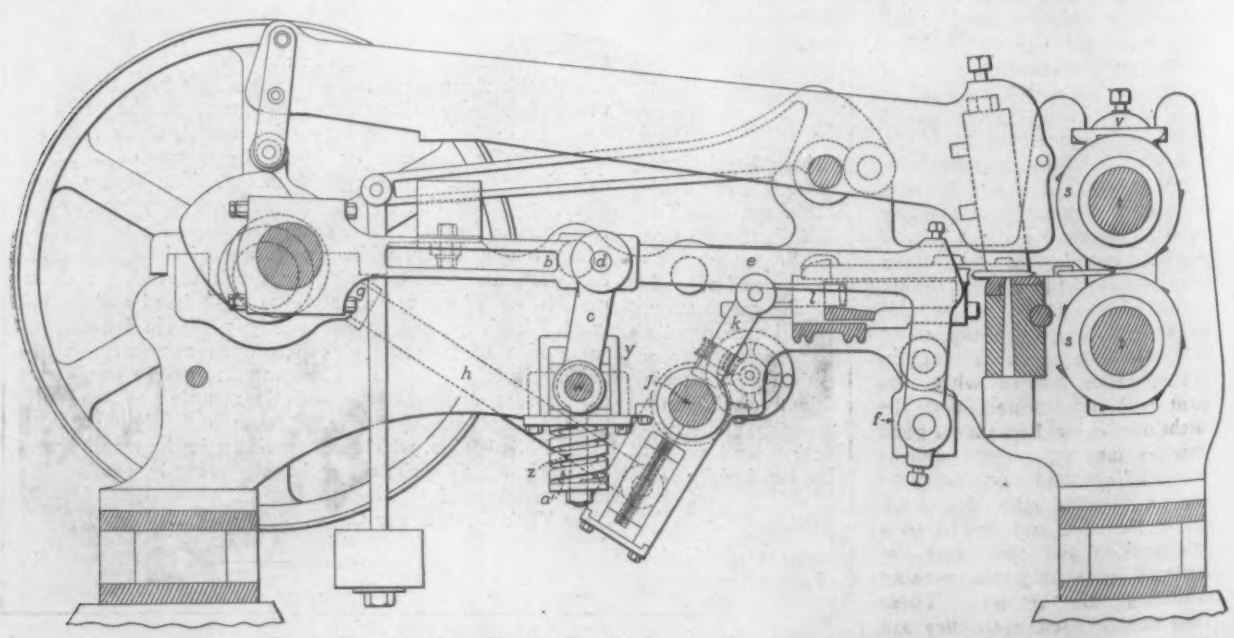


Fig. 2—Elevation of the Machine Showing Details of Its Operation and Construction

operates the nipper shaft *j*, Figs. 2 and 3, D, Fig. 4 and the main nipper rocker *k*, Figs. 2 and 3. This in turn drives two small but powerful nipper rods *l* and *m*, which are connected with the nipper slide *n*, E, Figs. 1 and 4. In this machine a T coupling joins the nipper rod to the slide and has a bearing surface which is said to be from 10 to 12 times larger than the ordinary pin coupling at the same point on the old type. These slides are larger, with a corresponding increase in the bearing surface. A greater range of adjustment can be made and the slides can also be removed and replaced in a much shorter time. The slides are held in slots extending through the entire thickness of the frame, an arrangement which gives a larger holding surface.

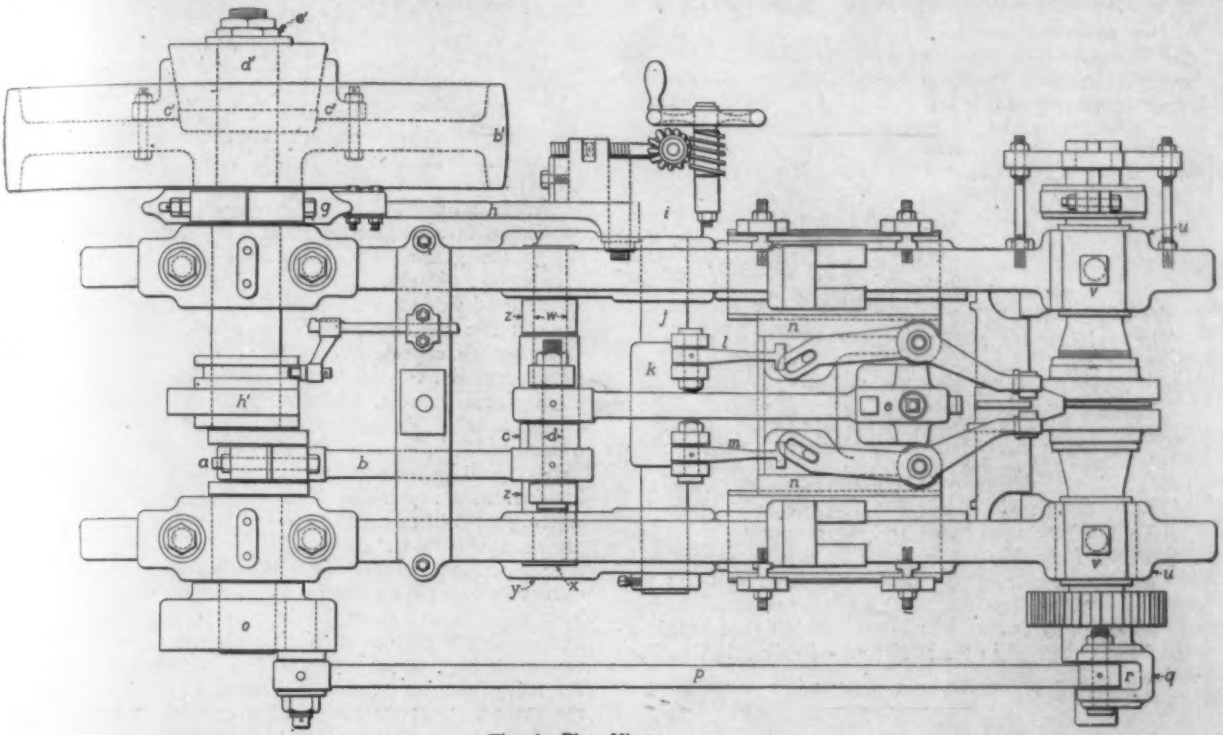


Fig. 3—Plan View

The feed roll pointing mechanism is designed with a view to obtaining great rigidity of parts in forming the point of the stroke and of ready accessibility in keeping the cutter tools in good condition. These rolls are operated independently from the main shaft by a crank disk *o*, Figs. 2 and 3, F, Fig. 4, through the connecting rod *k*, Figs. 2 and 3, G, Fig. 4; the ratchet box *q*, Figs. 2 and 3, H, Fig. 4; the power being transmitted to the ratchet wheel *r*, Figs. 2 and 3, I, Fig. 4, which operates the rolls *s*, Fig. 2. The pointing roll shafts *t* are of reinforced construction and measure 7¼ in. in diameter and can accommodate six or seven cutters. The side chucks J, Fig. 1, are designed to hold the side rings K tightly against these cutters while the point is being formed, and the mechanism is rigid so that a good point is insured. These chucks can be adjusted to vary the position of the side ring, the chuck can be loosened and moved to a new position and the chuck retightened in about 3 min. without disturbing the cutters. These rings can be used until they are almost worn through, which eliminates the necessity of frequent renewal, and it is emphasized that with this construction it is practically impossible for fins to develop on the points of the spike. The cutters are held in such a position that they do not touch when the machine is running idle, and in this way the chipping of the cutters is prevented.

As it is necessary to prevent the slightest movement of the pointing rolls in the housing when the point is being formed, a special feature in the Farrow design enables all movements to be controlled and at the same time the ready removal of the rolls from the housing is permitted. An oblong plate is fitted in the forward part of the housing *u*, Figs. 2 and 3, which is held in position tightly against the boxes by a set screw L, Figs. 1 and 4. A cast-iron holding down cap, M, *v*, Figs. 2 and 3, is mounted on the roll housings and acts as a breaker if a careless feeder should get his tongs in the rolls.

A positive automatic relief is provided for any obstruction between the heading tool and the dies. The shaft *w*, Figs. 2 and 3, passes through the heading rocker *e*, which is mounted loosely on the shaft between the frames of the machine. An oblong block, *x*, is fitted to the ends of the shaft and in turn fits loosely in the housings *y*. Ring bolts *z* and a nest of springs, *a'*, Fig. 2, hold the shaft down. The strap *b'*, Figs. 2 and 3, and the heading bar *e*

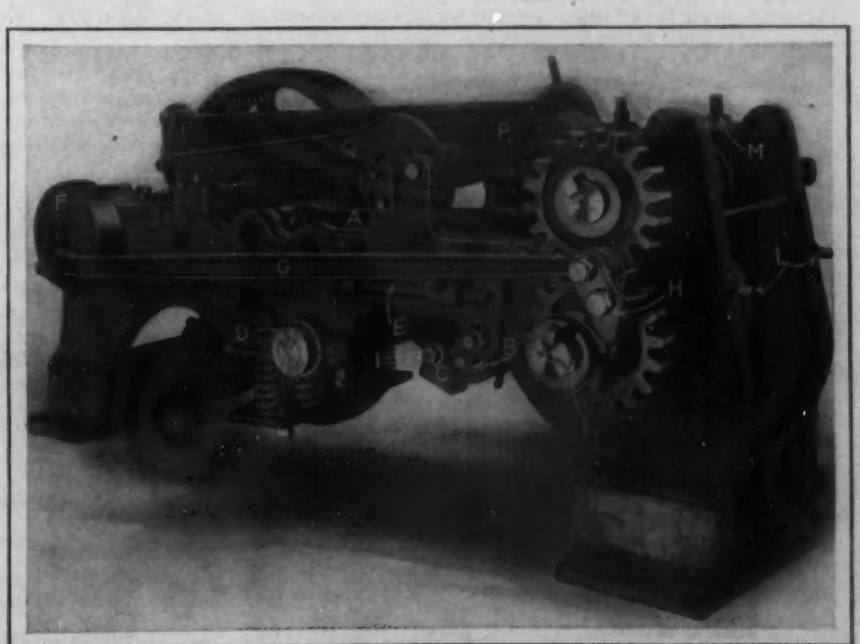


Fig. 4—Rear View

engage at an angle so that any obstruction between the heading tool and the die causes the relief to rise vertically in the housings *y*, thereby shortening the distance between the heading tool and the die. On the backward stroke of the crank the nest of springs brings the relief back to its original position.

The machine is driven by a friction drive so that any jamming between the header and the die will stop the machine automatically, an arrangement which prevents serious breaks, and it is claimed will reduce the cost of repairs at least 80 per cent. and increase the output at least 30 per cent. The driving wheel is not keyed to the shaft but is mounted loosely thereon and on the wheel *b'*, Fig. 3, is bolted a steel friction chamber N, Fig. 1, *c'*, Fig. 3. A friction clutch, *d'*, O, Fig. 1, is fitted in this chamber and is keyed to the main shaft. This clutch can be adjusted to the required load by tightening the nut *e'*, Fig. 3, on the end of the shaft.

The griping lever is constructed so as to reduce the strain on the machine and to give a uniform griping power when the spike is being headed and thus insures a uniform product. This lever, which is indicated by *f'*, Fig. 2, P, Fig. 4, is fitted with a weight relief, Q, *g'*, Fig. 2, which takes care of all obstruction between the tool and the die. The fulcrum of the lever is so located that a minimum amount of work is put on the cam *h'*.

This machine will make spikes from 4 to 7 in. long with points from 5/8 to 2 in. from 3/8 to 1 in. square rods. The average output of the machine is from 12 to 14 tons per 10-hour day and the machine is guaranteed to give an average daily output of 10 tons. This figure has, however, been exceeded in tests, 16 tons of spikes having been made in 12 hr.

Brooklyn Power Plant of American Sugar Refining Company

In the installation of steam piping in its new power plant in Brooklyn, N. Y., the American Sugar Refining Company has successfully solved the problem of branch connections in large high pressure steam lines by the substitution of interlock-welded necks in place of the heavy and somewhat expensive cast iron or steel fittings.

The new boiler house is equipped with 24 Babcock & Wilcox boilers in two groups, one on the first and the other on the second floor of the building. Each boiler is connected into its header through a non-return valve, a U expansion bend and a stop valve. Each header is made up of 20-in. and 24-in. pipe, a 24-in. line delivering steam from one header into the mains at 200 lb. pressure and from the other into the 36-in. evaporating line at 100 lb. pressure, the piping being so arranged that either group of boilers may be used on either high or low pressure. Steam at 200 lb. is furnished to the engines, which exhaust at 100 lb. back pressure into the evaporating system. A special blow-off valve is also used in the 200-lb. line. It is set to operate at a few pounds less than the safety valve, and excessive pressures are relieved through the 36-in. low pressure line instead of the steam being blown off through the safety valves and wasted. Lap weld pipe is used for the 36-in. line as well as the smaller ones.

The notable feature of this installation, as mentioned above, is the exclusive use of the interlock-welded neck for branch connections in place of cast fittings, making a leak-proof joint as strong as the pipe itself and cutting down the weight of the line considerably. Atwood flanged joints, with rolled steel flanges, are used throughout for line joints. In addition to numerous smaller valves, there are in this installation four 24-in. and eight 20-in. cast steel gates with Monel mountings, 800 lb. test pressure. All pipe, bends and valves are being furnished and erected by the Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa.

The American Steel Foundries announces the resumption of work at its East St. Louis plant, which has been closed for nearly a year. It begins with a force of 800 men, to be increased to 1500 by June 1.

An indication of the growth of copper consumption is found in the fact that the American Brass Company is doing the largest business in its history.

Electrically Operated Valve Equipment*

BY H. M. GASSMAN, BIRMINGHAM, ALA.†

Valves 24 in. in diameter and larger are generally operated by other means than by hand, because they must be closed in a short time and also on account of their location in out of the way places. It is important that the electrical equipment of such valves be dependable, and to guard against failure they should be inspected and tested regularly. The paper in a general way is concerned with the operating conditions encountered and the principles governing the design of equipment intended particularly for large gate valves for water and steam connections. From a mechanical point of view it is necessary to consider the maximum torque which can be exerted by the motor, and design the gearing and attachments accordingly. As the proportion of maximum motor power to mechanical strength of valve and mechanism is greater in large valves than in small ones, it is necessary that more attention be given to the control and equipment of the former. The power required to open a valve is a maximum when starting it from its seat, and after the gate has been opened comparatively little torque is required to complete the operation. The reverse is true when hydraulic valves are being closed under pressure. Although the torque at closing increases rapidly, it does not reach the value of the starting torques required to open the valve under the same pressure conditions.

To prevent the sticking of the valve when it is to be opened, a lost motion device is provided to give a hammer blow when starting the valve from its seat, and in alternating-current motors such a device permits the motor to develop a high speed and a greater torque before starting the valve from its seat. Provision must be made in closing the valve to limit the torque of the motor so as to prevent jamming and resultant injury to the valve mechanism. The motor drive for these valves is designed so that they can be opened and closed in from 2 to 5 min., and a mechanical or electric indicator should be provided to show the position of the gate. When compactness is a consideration the motor is rigidly attached to the valve casing or an extension thereof, an inclosed motor being preferred on account of the exposure to dampness, flooding, etc. Care must also be taken to protect the terminals and wiring against water and mechanical injury. The size of the motor for the valve will vary with the duty and the general conditions under which it operates.

Direct-current motors are preferred for work of this nature, since they give the advantages of a series-wound motor, high starting torque and increased speed under light load, although the commutator and brush rigging are apt to cause trouble. The best type of alternating-current motor is the squirrel cage, and this should be from 20 to 40 per cent. larger than the direct-current motor. An ideal arrangement for remote control is one in which it is simply necessary to throw a switch and it is impossible to start the valve in the wrong direction.

The Parkesburg Iron Company's Operations

The Parkesburg Iron Company, Parkesburg, Pa., is operating its plant on a better basis than for a long time. Its new mill is running to capacity, and its old plate mills and forges are greatly surpassing recent performances. The demand for high-grade, genuine charcoal iron boiler tubes has been so large that consideration is being given to improvements which will increase the capacity in this department. The company's three welding furnaces are now in full operation. One plate train that had long been idle was started up recently, making three plate trains now in operation in the old mill. The plant has 16 forge fires now in operation, and indications are that the number will be increased. Some difficulty has been experienced in obtaining sufficient men to operate the works to the capacity desired.

At a special meeting of the Cleveland Engineering Society, Cleveland, Ohio, May 27, a paper on "The Engineering of Men" will be read by Willard Beahan, first assistant engineer of the Lake Shore Railroad.

*From a paper read before the American Institute of Electrical Engineers, Pittsburgh, April 25-27.

†Electrical Engineer, Tennessee Coal, Iron & Railroad Company.

Tests of a Reversing Rolling Mill*

Performance After Five Years of an Electrically Driven Reversing Universal Plate Mill of the Illinois Steel Company

BY WILFRED SYKES†

About the middle of 1905 it was decided by the Illinois Steel Company to make inquiries regarding the possibility of installing an electrically driven reversing universal plate mill. In the spring of 1906 a contract was let for the complete installation. The machines and apparatus were designed in June, 1906, and the complete equipment was delivered by the end of the year, and started in operation at the beginning of 1907. In the meantime, the first European installation at Hildegradehuetts was started in operation and before the plant of the Illinois Steel Company was used commercially a second European plant was started. It is interesting to note, however, that the installation of the Illinois Steel Company was the second plant of this type to be ready for service.

The mill is of the two-high universal type, designed for rolling plates up to 30 in. wide from slabs up to a maximum of 10 in. thick. The main horizontal rolls are 24 in. in diameter, and have a face of 34 in. The vertical rolls, of which there are four, two on either side of the main rolls, are 14 in. in diameter and have a face of 13 in. The mill was designed to roll plates of all thicknesses, and, on account of its flexibility, is used to a very great extent for handling small orders. The motor-generator set, for supplying power to the main roll motors, is erected in the same room as the main roll motors. Apart from the method of driving the mill is not appreciably different from similar steam-driven installations. The motors are enclosed in a separate room to protect them from the mill dust.

The setting of the horizontal rolls is varied by means of an electrically driven screw-down, the screws being operated by a 50-h.p. mill type motor. The setting of the vertical rolls is controlled by means of a 30-h.p. mill type motor, the position of the rolls being shown by the usual micrometer type of indicators. The main rolls are connected to the pinion housing by suitable spindles, arranged to allow a movement of about 12 in. The lower pinion is driven from the roll motor through a coupling of the usual mill type, arranged to allow for considerable wear in the pinion shaft bearings. No flexibility is allowed for in the drive from the motor to pinions.

The mill was designed for a maximum speed of 150 r.p.m., but it has been found in practice that about 100 r.p.m. is all that can be conveniently used on account of the comparatively short plates rolled. The capacity of the mill varies considerably on account of the material rolled and depends more on the product required than on its capacity for rolling, and therefore definite figures cannot be given for the output for any particular product. The performance of a mill of this type cannot be compared with that of a blooming mill, rolling practically one size of material. The equipment of this mill had to be sufficiently large to handle the heaviest slabs that can be rolled, although the work is comparatively light most of the time and consequently the tonnage suffers.

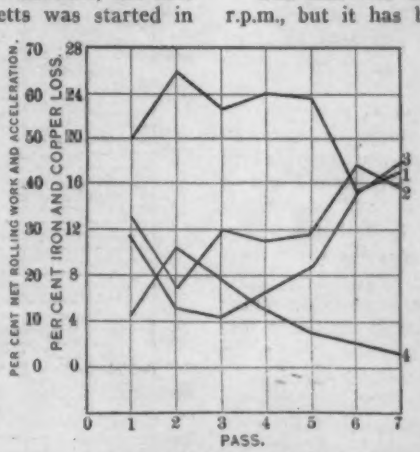


Fig. 2—Analysis of Power Corresponding to Fig. 1

1 Percentage of net rolling work to total input
2 Percentage of acceleration work to total input
3 Percentage of friction and iron loss to total input
4 Percentage of copper losses to total input

Finished plate 5/16 x 12 x 1016 in.—Temperature of metal, 1860 to 1810 deg. F.—Composition: Carbon, 0.10 per cent.; phosphorus, 0.033 per cent.; manganese, 0.51 per cent.; sulphur, 0.044 per cent.—Ultimate tensile strength, 53,000 lb. per sq. in.

System of Driving

In deciding upon the system to be used for driving the mill, and the control of the motors, the experience gained in the design of large hoisting plants of the Ilgner type was drawn on. In 1903 experiments had been made to determine the possibility of rapid reversing and the sensitiveness of this system of control on a large hoisting plant. The ordinary solid field generator cannot follow rapid change in the excitation on account of the eddy currents which are set up and which oppose any change of field strength. It is therefore necessary to design the machine with a completely laminated magnetic circuit so as to overcome this characteristic of the ordinary generator when working under the conditions met with in such service. The importance of having the voltage of the generator

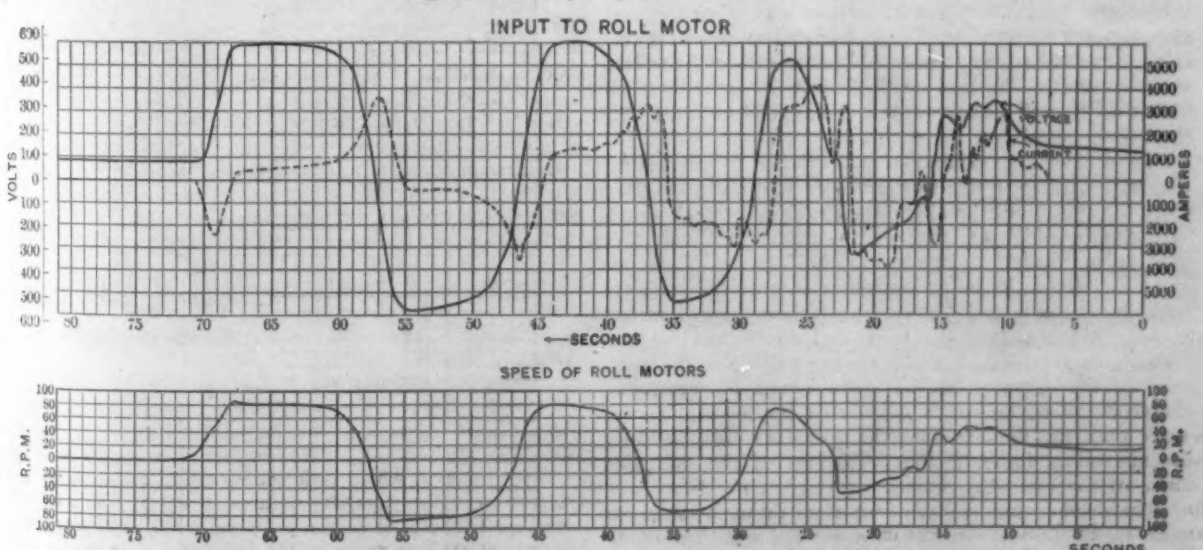


Fig. 1—Test Curves When Rolling a 3½ x 11½ x 94.9 In. Slab to a 5/16 x 12-In. Plate

*From a paper read before the Pittsburgh meeting of the American Institute of Electrical Engineers.

†Westinghouse Electric & Mfg. Company.

follow the changes of excitation quickly is very great from an operating standpoint and this condition has been very well fulfilled in the Illinois Steel Company's installation.

The roll motors are connected to a double-commutator generator without any starting resistance, each motor being connected to one commutator. This generator is driven by means of a three-phase induction motor, and a 100-ton flywheel is mounted on the same shaft. The roll motors are separately excited, the excitation being constant, with speeds up to 100 r.p.m., and the polarity is not changed. The direction of rotation and speed of the roll motors is controlled by changing the polarity of the generator and varying its field strength, thereby varying the voltage applied to the armatures of the roll motors. This system avoids rheostatic losses, except in the field circuit, and enables any desired speed to be obtained, independent of the load.

The load on the generator naturally varies rapidly over a large range, the rate of change being at times 3000 to 4000 h.p. per second during acceleration and 8000 to 10,000 h.p. per second when braking. From the standpoint of the power supply, such a load would be highly undesirable even for a very large power house, and could not be handled at all by gas engine driven stations of moderate capacity, such as usually found in steel mills. In order to equalize these fluctuations the flywheel was provided to deliver energy during the periods of great demand and to store energy during periods of light load, and so that the flywheel may give up some of the energy stored in it the speed must be reduced, and to store energy the speed must be increased.

To enable the flywheel to assist the three-phase motor in driving the generator, an automatic slip regulator was provided, which introduces resistance into the rotor when the current reaches a certain value, the speed being thereby reduced and a portion of the energy stored in the flywheel is used for driving the generator. When the load on the generator is reduced the resistance is automatically cut out, the speed consequently increasing and energy is thereby stored in the flywheel. In practice the maximum load on the line due to the reversing set is approximately one-fifth of the maximum load of the generator. By properly setting the regulator in relation to the work to be done the input to the motor-generator can be maintained practically constant. The driving motor of the set is considerably smaller than the generator, due to the fact that the latter must be designed to carry the high peak loads and as the heating of the armature is due principally to the copper loss, which varies as the square of the current, a much greater capacity is required to deliver a certain amount of power than would be necessary if the load were constant. The load on the induction motor does not vary greatly and consequently it is designed to carry only the average load.

To protect the generator and driving motor against excessive overloads, due to stickers or cold slabs, overload trips for the circuit breakers are provided in each armature circuit, which are arranged to open the circuit at a load corresponding to approximately 8000 h.p. The primary circuit of the induction motor is provided with the usual instruments and overload protection. Speed meters showing the speed of the rolls, and double reading ammeters are provided on the operating pulpit for the guidance of the operator. It has been found, however, that the electrical equipment is capable of performing heavier work than the mill, so that the operators are controlled during rolling more by the limitations of the mill than those of the electrical equipment.

The driving motors have a nominal rating of 2000 h.p. each, making a total of 4000 h.p. for the set. The motor was divided into two units, with the object of reducing the armature diameter, and consequently the inertia, and at the same time to facilitate handling the heavy current which at 8000 h.p. is about 11,000 amperes. They are designed for a normal armature voltage of 575, and 220 volts excitation. When the plant was designed it was proposed to increase the speed from 100 r.p.m. to 150 r.p.m. for the longer passes, and, so as to insure that the flux in the motor fields would follow the quick changes of the exciting current, the magnetic circuit was laminated. Experience gained from the operation of the plant has shown that this refinement was unnecessary, although required in order to meet the original guarantees for acceleration and reversal asked for.

The importance of reducing the armature diameter and weight will be appreciated as the energy varies as the square of the speed. In the American installation the inertia has been kept somewhat lower than in the European plant, although the latter was installed about two years later. The weight of the complete motor (two machines)

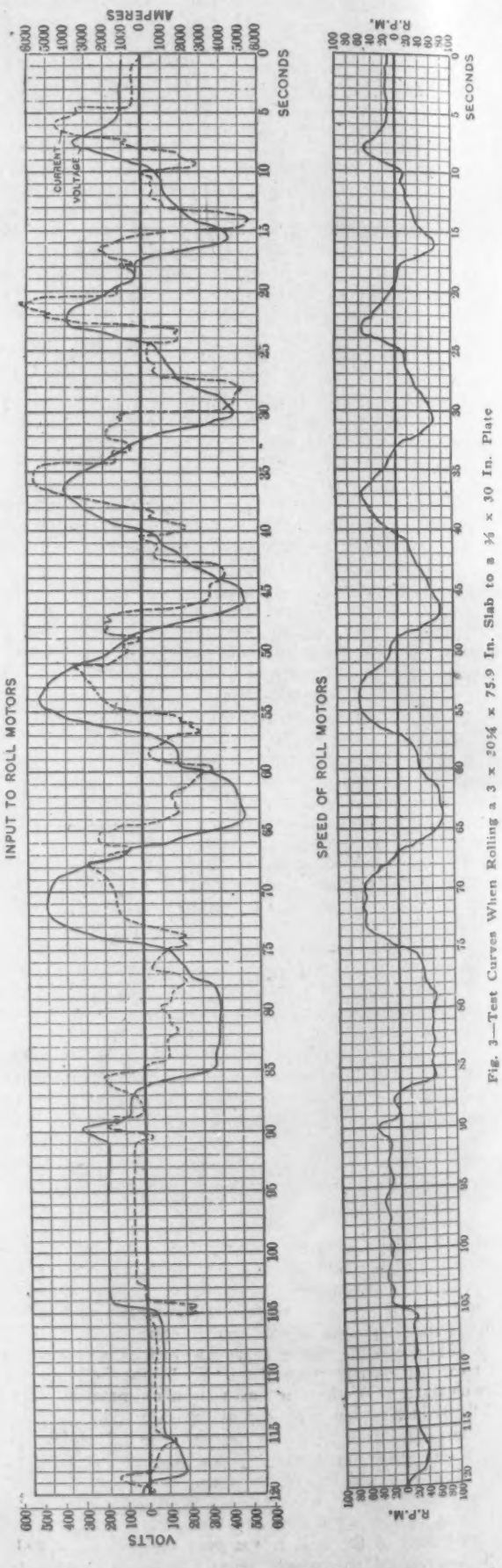


Fig. 3—Test Curves When Rolling a 3 x 20¼ x 75.9 In. Slab to a ⅜ x 30 In. Plate

is 356,000 lb., made up as follows: Rotating part, 124,000 lb.; fields, 107,000 lb.; base and bearings, 125,000 lb.

Test Results

After five years' operation it was decided that it would be advisable to make a complete set of tests to determine not only operating characteristics, but also whether such an installation could be improved upon and how closely the designed capacity approximated to the actual operating conditions. The current in the motors varies, under normal conditions, so rapidly that it was therefore decided to use an oscillograph for recording the direct-current voltage and current. The speed of the roll motors was recorded by means of a special graphic recording meter, controlled by suitable magneto, driven from the motor shaft. The recording instrument was especially designed so as to be capable of following rapid changes in speed, and to avoid errors usual with graphic instruments. It was decided to avoid the use of a pen for recording and the position of the pointer was recorded by causing a spark to pass from the end of the pointer through the paper to an insulated plate. Provision was made to avoid introducing errors in the readings due to the static effect of the high-tension current for the spark. The speed recording instrument for the roll motors had a center zero so as to record both directions of rotation.

The speed of the motor-generator set was also recorded

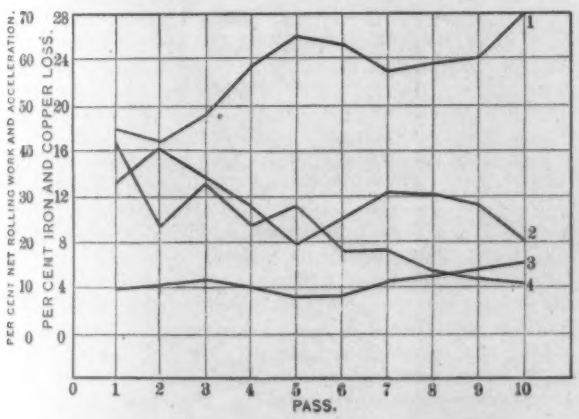


Fig. 4—Analysis of Power Corresponding to Fig. 3

1. Percentage of net rolling work to total input
2. Percentage of acceleration work to total input
3. Percentage of friction and iron loss to total input
4. Percentage of copper losses to total input

Finished plate, ¾ x 30 x 612 in. Temperature of metal, 2,030 to 1,200 deg. F.—Composition: Carbon, 0.18 per cent.; phosphorus, 0.025 per cent.; manganese, 0.48 per cent.; sulphur, 0.038 per cent.—Ultimate Tensile Strength, 62,900 lb. per sq. in.

to determine the amount of energy given up or absorbed by the flywheel during the period of rest. The instrument used was similar to that adopted for the recording of the motor speed, except that provision was not made for recording the speed in both directions. In order to obtain a large reading for a comparatively small change of speed a battery was connected to oppose the magneto, and the meter recorded the difference in the potential of the magneto and the battery. All the instruments, including the oscillograph and the speed meters, were provided with a time recording device, all of these attachments being controlled by a single contact-making clock. The input of the motor-generator set was determined by means of a wattmeter of the same type as the speed meters.

In addition to the above apparatus provision was made for recording signals from the mill. In the mill records were obtained as to the size and weight of material rolled and the reduction per pass, and at the same time readings were taken to determine the temperature of the metal. These tests gave simultaneously readings of the input to the roll motors and the input to the motor-generator set at the speed of the set and motors. With the known characteristics of the apparatus and the data obtained as to the work done by the mill, it was possible to obtain a complete analysis of the power requirements and operating characteristics.

Fig. 1 shows the power required for rolling a slab 3½ x 11½ x 95 in., weighing 1080 lb., to a plate 5/16 in. thick by 12 in. wide and 1060 in. long. It will be seen that the maximum current was approximately 4100 amperes, and the maximum braking current about 2350 amperes. The maximum speed of the rolls during this test was 86 r.p.m. during the sixth pass, whereas in the first pass the maximum speed was 50 r.p.m. The total time required from beginning to end of the test was 58 sec., showing a maximum capacity when rolling this size material of approximately 30 tons per hour. The temperature of the metal varied during the test from 1920 deg. F. to 1800 deg.

In Fig. 2 is shown an analysis of this test, which gives the relations between the total input to the roll motors and the various items. It will be seen that the percentage

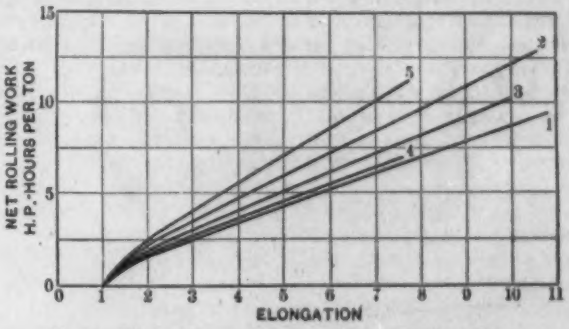


Fig. 5—Typical Power Requirements in Rolling Plates

Slab	Plate	Temperature deg. F.
1.—4 x 21.5 x	95 in. to ¼ x 21¼	in., 2,160 to 1,536
2.—4 x 21.5 x	60 in. to ⅜ x 21½	in., 2,172 to 1,578
3.—4 x 8 x	100 in. to ⅜ x 8⅜	in., 2,208 to 1,944
4.—6 x 9½ x	90 in. to ¾ x 10	in., 2,076 to 1,800
5.—6 x 7¾ x	82 in. to ¾ x 8	in., 2,016 to 1,692

of net rolling work averages about 55 per cent. The input required for acceleration is about an average of 30 per cent. The loss due to friction of the mill and iron loss in the motors is approximately 10 per cent. The average copper loss is about 5 per cent. The reason for the very large drop in the percentage of net roll work in the last two passes is the fact that the draft was comparatively light on these two passes.

The comparatively large proportion of the input required for acceleration shows the importance of keeping the inertia as low as possible, and the great advantage of the voltage control system is that it enables a considerable proportion of this energy to be recovered. In this particular test the total energy required to accelerate the motors for the seven passes was 11,900 h.p.-sec., and there was returned by the motors to the generator 8,317 h.p.-sec. or somewhat more than 70 per cent. It should be noted that with this system the energy taken from the generator is only half what is would be if rheostatic control

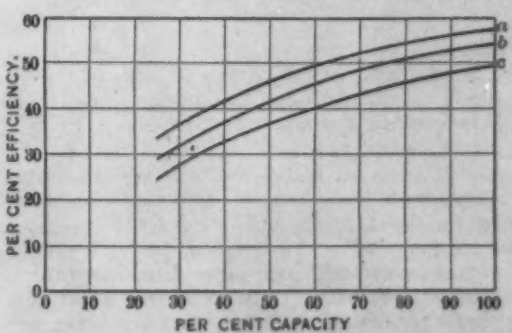


Fig. 6—Efficiency of Universal Reversing Plate Mill Under Various Conditions

Overall Efficiency, from Input to Power Required to Displace Metal, Including Mill Friction

a. Rolling Slab 7 x 30¼ x 76 in. to ⅜ in. Plate.
b. Rolling Slab 5 x 30¼ x 76 in. to ⅜ in. Plate
c. Rolling Slab 3 x 30¼ x 76 in. to ⅜ in. Plate

were used and that with the latter system none of the energy would be recovered. In this test if rheostatic control had been used the total energy required for acceleration would have been 23,600 h.p.-sec., which would have increased the total net input to the motor about 50 per cent.

In Fig. 3 are shown the curves when rolling a slab 3 x 30 x 76 in., weighing 1960 lb., to a plate ⅜ in. thick by 30 in. wide. The total time of the test was 100 sec., indi-

cating a maximum capacity of the mill when rolling these slabs of approximately 36 tons per hour. It will be seen from these curves that the maximum loads are considerably higher than shown in Fig. 1. In this case the maximum current input is slightly in excess of 6000 amperes, and the braking current reaches a maximum of approximately 3150 amperes. The maximum speed of the mill did not exceed 75 r.p.m. during any pass. The temperature of the metal during this test varied from approximately 2040 deg. to 1300 deg. F.

In Fig. 4 is shown an analysis of this test, from which it will be seen that the percentage of net rolling work to the total input gradually increased, and the percentage of power required for acceleration decreased. The copper losses decrease on account of the maximum current being smaller, and naturally the friction loss increases as the mill is running the greater percentage of the time. The percentage of energy returned by the roll motors was about 62 per cent. of the input for acceleration. An examination of a number of other tests taken at random gives the figures given in the accompanying table:

Table of Energy Returned by Roll Motors

	Input for acceleration	Energy returned during braking	Percentage
1	21,610	14,197	66
2	21,700	14,215	65.5
3	18,855	10,657	56.5
4	18,208	12,512	68.7
5	17,035	9,105	53.5
6	20,320	12,449	61.5
7	23,800	15,546	65.5
8	18,620	12,111	65
9	29,195	24,058	82.2
Total	189,343	124,850	66

The power required to displace the metal varies considerably, depending upon the operating conditions. The absolute figures depend upon the temperature of the metal, its composition and the type of mill, etc. The power required increases very rapidly with the reduction in thickness, this being due to the greater density of the metal, the lower temperature and the lower rate of displacement.

In Fig. 5 are shown some curves of the net rolling work per ton plotted against elongation, and it will be seen that the variation is considerable. The difference in the total power required may show a much greater variation than given, but these curves will indicate in a general way how the net rolling work varies with the displacement of the metal. In a test made when rolling a certain slag, in seven and in fifteen passes, the net rolling work showed a difference of about 10 per cent., but the total input varied about 50 per cent., due to the reduced capacity of the mill when rolling at the lower rate. Such points as these show the importance of a very close examination of operating conditions when designing a mill of this kind, and to insure success an electrically driven reversing rolling mill requires very careful engineering, as the problem is not so much to get a mill that will work as to get one that will work economically.

In this mill it is the general practice during the earlier passes to have the feed rolls running at full speed in the opposite direction to main rolls, so that when the slab leaves the mill it is returned in the shortest possible time. In spite of this the main motors are easily capable of reversing in ample time. An examination of a large number of tests on this and other mills shows that the average rate of acceleration used does not exceed about 20 r.p.m. of the rolls per second, the maximum being about 30 r.p.m. per second. The rate of retardation is, however, very much greater and generally varies between 40 and 50 r.p.m. per second.

The overall efficiency of the plant depends in the first place upon the relation of the size of equipment to the material to be rolled. As already pointed out, a mill of this kind cannot be compared to one rolling only a single product, in which case the operating characteristics can be very accurately predicted. As this mill will be often underloaded, the efficiency naturally suffers, which is true, independent of the system of driving. In Fig. 6 are shown some overall efficiencies when rolling slabs of various sizes, and it shows how the results improve with an increasing load. In addition to the losses in the electrical equipment these curves also allow for the friction of the mill.

Use of Alternating Current in Unloading Coal*

BY W. N. RYERSON AND J. B. CRANE.

In the decade from 1900 to 1910 the receipts of coal in Duluth-Superior harbor increased from 2,600,000 to 8,300,000 tons. This fuel comes from the Pennsylvania and West Virginia coal fields and is trans-shipped at the Lake Erie ports. At present three types of machinery, the bridge tramway, the cable car and the man trolley, are installed for transferring the coal from the vessels to the cars or the storage piles. The bridge tramway consists of moving bridges, locomotive cranes, box-car loaders and screening towers. The boats are moored to the unloading side of the dock and if the fuel is to be shipped out immediately it is taken from the boat and loaded into cars at the opposite end of the dock. If it is to be screened it passes through the screening towers and is then loaded into cars by gravity, while coal for storage is dropped directly on the storage pile. In this installation 25-cycle, three-phase, 13,000-volt power is delivered to the terminals of a transformer house where it is reduced to a pressure of 440 volts for distribution about the dock. This is accomplished in a novel manner. Posts about 4 ft. high are spaced at intervals along both ends of the dock and have three contacts placed one above the other mounted upon them. These contacts are about 15 in. apart and the current is transferred to the moving machinery by shoes which span two posts at a time. The bridges, which have an extreme length of 506 ft., are controlled from cabs at either end of the bridge and are operated by cables running over sheaves. The buckets are of the clamshell type and hoist from 3 to 4 tons at a lift. All of the motors employed on the bridges, cranes, box-car loaders and screening towers are of the wound rotor type.

The cable car installation consists of an elevated railway on which are mounted the hoisting towers and tracks for the cars. Energy is transmitted at a potential of 440 volts and is delivered to the hoisting towers and traveling bridge by trolley wires. Pneumatic control is used in this installation and the only trouble experienced has been with its freezing in winter due to moisture collecting in the pipes and some slight trouble with the hoisting motors.

The two previous types of equipment are adaptations of steam-operated rigs to the use of electricity, while the man trolley equipment is an effort to devise something particularly adapted to the use of electric motors. Two types are in use at the present time, the difference being in the hoisting speed and the type of control. In this case the operating current is carried to 13,000-volt, three-phase catenary trolleys running the whole length of the bridge and the transformers for reducing the potential to 440 volts are located in the cabin at the top of each bridge. The machine shops and car pullers receive their 440-volt energy from a transformer located in the junction house. Clamshell buckets carrying 5 tons of coal are employed. In one of the equipments the control is direct-current magnetic actuated by air, the current being furnished by small motor generator sets and the air by small compressors in each cabin. Both pneumatic and dynamic braking is used. In the second type the control is alternating-current magnetic and the braking is friction operated by foot levers. The first type of equipment has been in use for about two years, and while considerable trouble was experienced at first the difficulties are being overcome and satisfactory results are now assured. Thus far the second class of equipment has operated without any trouble at all, but as the period has been very short—about six months—it is not possible to draw definite conclusions as to its results at this time.

The Eastern office of the Lynchburg Foundry Company has been moved to 1 Broadway, New York City. The company has also opened a San Francisco office at 461 Market street. This will be in charge of J. W. Blair, formerly treasurer of the American Cast Iron Pipe Company. In addition to the product of the Lynchburg Foundry Company, that of the American Cast Iron Pipe Company will also be handled on the Pacific coast by this office.

*From a paper read before the American Institute of Electrical Engineers, at Pittsburgh, April 25-27.

Pittsburgh and Vicinity Business Notes

Mackintosh, Hemphill & Co. will have ready for inspection at their works at Twelfth and Etna streets, Pittsburgh, on May 20, 21 and 22, a three-cylinder reversing engine, which is about completed for the Algoma Steel Company, Sault Ste. Marie, Ontario. This engine is of very heavy construction, the cylinders being 36 in. diameter and 40-in. stroke. The piping is arranged so that the engine can operate either as a simple three-cylinder high-pressure engine or as a compound, using one cylinder for high pressure and two for low pressure. The crankshaft is made in three sections, the cranks being set at 120 deg. The end of the crankshaft is arranged to be coupled directly to the mill at either or both ends, as may be desired. The engine is designed especially for running at high speed and embraces many features of interest, among which is the detail of the valve motion with the method of suspending it. It is expected to make shipment of this engine about June 1. Other work on the floor includes a 44 and 70 x 60-in. blooming mill engine for the Pittsburgh Crucible Steel Company, Midland, Pa., and a 48 x 60-in. standard, direct-connected, reversing engine for driving the universal plate mill of the United Steel Company, Canton, Ohio.

The Mahoning & Shenango Railway & Light Company, operating an electric street car line between Youngstown and Sharon, Pa., has placed a contract with Stone & Webster, Boston, Mass., for a very large power station, to be erected at Lowellville, Ohio. This station is expected ultimately to generate 40,000 hp.

The Kindl Vessel Unloading Machine Company, Pittsburgh, has been organized to put on the market a new unloading device designed by F. H. Kindl, consulting engineer, who is president of the new company. N. C. Wilson is treasurer and Henry F. Gilg, secretary.

The borough of Homestead, Pa., has employed Chester & Fleming, hydraulic engineers, Pittsburgh, to design and install a high-service pumping station to supply the high districts of the borough with water.

The special meeting of stockholders of the Westinghouse Machine Company, which was to have been held in East Pittsburgh May 2, has been postponed until May 23.

Orders have been received by the Westinghouse Machine Company, East Pittsburgh, for turbine engines to add to the apparatus for supplying power for electric headlights for the Chicago Great Western, Illinois Central, St. Paul, Northwestern, Rock Island and Mobile & Ohio railroads. The turbine engine occupies little space on a locomotive and has been found practicable in utilizing the exhaust steam, effecting an economy.

The Elliott Company, Pittsburgh, manufacturer of the Pittsburgh feedwater heater, has sold a 10,000-hp heater to the Pittsburgh Steel Company for installation at Monessen, Pa., and two 5000-hp heaters to be installed in the E. A. Ford Plate Glass Works, Toledo, Ohio.

A special meeting of stockholders of the Flannery Bolt Company, Pittsburgh, will be held July 1 for the purpose of voting on a proposition to increase the capital stock from $300,000 to $750,000.

The Ohio Society of Mechanical, Electrical and Steam Engineers will hold its annual meeting in Pittsburgh this week, the sessions opening on Thursday evening in the rooms of the Engineers' Society of Western Pennsylvania in the Oliver Building. The sessions of Friday and Saturday will be held in the Carnegie Institute of Technology. Arrangements have been made for inspection trips to the Westinghouse plants, the works of the Mesta Machine Company, the Rankin plant of the McClintic-Marshall Construction Company and the South Side works of the Jones & Laughlin Steel Company. E. M. Adams, Akron, Ohio, is president, and Prof. F. E. Sanborn, Ohio State University, Columbus, Ohio, is secretary and treasurer.

The Wheeling Traction Company, Wheeling W. Va., is considering plans for the erection of additional shops to cost $100,000.

Work is progressing on the new plant of the Penn Motor Company at New Castle, Pa., and the placing of machinery will soon be started, a good part of the equipment to be removed from the present works of the company at Pittsburgh.

For the first time in several years part of the plant of the Westinghouse Air Brake Company, Wilmerding, Pa., is operating night turn four days a week.

The Neville Iron Company, Curry Building, Pittsburgh, dealer in iron and steel scrap, is equipping its yards at Neville Island with electrically operated cranes, metal breakers and shears and hydraulic machinery for compressing material into bundles. Its yard has direct connections with the Pennsylvania, Baltimore & Ohio and Pittsburgh & Lake Erie railroads, affording excellent shipping facilities.

The Brier Hill Steel Company, Youngstown, has placed some large orders for motor equipment for its new open-hearth steel plant with the General Electric Company.

The Bessemer & Lake Erie Railroad, controlled by the Carnegie Steel Company, has commenced its ore movement from the Lakes to its blast furnaces in the Pittsburgh district, and has already moved ore at the rate of 50,000 tons per day. This is equal to the mid-season movement for former years.

The Standard Steel Car Company, Pittsburgh, has let a contract for a steel car spring plant to be erected at Butler, Pa. The main building is to be 180 x 90 ft.

The new Hydrocarbon Company, Pittsburgh, has purchased from the receiver the plant of the American China Plate Company at Toronto, Ohio, and will install machinery for the manufacture of rubber novelties, roofing material and paints.

The Allegheny Steel Company, Pittsburgh, works at Brackenridge, Pa., manufacturer of open-hearth billets and sheet bars, plates, sheets and specialties, announces that Theodore G. Seixas has been made general manager of sales and W. Lester Walker general manager of the entire plant.

The Heer Engine Company, Portsmouth, Ohio, builder of high grade gas and gasoline engines, which is increasing its capital stock from $125,000 to $250,000, states that the increase is for the purpose of extending its works in both new buildings and further equipment. The company will install several large machine tools and a forge shop equipment.

Newark Industrial Exposition

The Newark Industrial Exposition, which opened May 13 at the First Regiment Armory, Newark, N. J., and will continue until May 25, is designed to show the wide range of industry and the industrial importance of Newark and vicinity. The industries represented show a variety of products from the smallest article of jewelry to a great hoisting engine. The exhibits of machinery are particularly impressive, as most of the equipment is shown in motion. The Newark Gear Cutting Machine Company has an interesting exhibit, showing a gear cutting machine and other appliances. The exhibit of the General Electric Company is a center of attraction, showing its motors applied to a number of different machines. The Crocker-Wheeler Company, Ampere, N. J., and the Bell Electric Motor Company, Newark, also have exhibits of a like character. The A. & F. Brown Company, Elizabethport, N. J., is showing a line of shafting, hangers, etc. The Crane Company, Newark, has an exhibit of valves, pulleys and mill supplies. The Crucible Steel Company of America, Harrison, N. J., exhibits a line of high-speed steel, dies and armor-piercing projectiles. The Barlow Foundry Company, Newark, shows a wide variety of malleable and gray iron castings. The Garvin Machine Company, New York, has a lathe and a milling machine in action. The booth of Gould & Eberhardt, Newark, excites much interest in the operation of a shaper. The Lambert Hoisting Engine Company, Newark, is exhibiting hoisting engines, both steam and electric. The printing trade has a complete printing shop in active operation wherein a daily bulletin is printed for free distribution. The exposition was formally opened and the lights and machines were set in motion when President Taft pressed a button in Bellaire, Ohio. It is given through the efforts of the Board of Trade and promises to be a yearly event.

The International High Speed Steel Company has moved its office and warehouse from the Fox Building, Franklin Square, to 478 Pearl street, New York, where a much larger stock of Bulldog steel will be carried, in all sizes and sections, solid and hollow.

THE IRON AGE

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CONTENTS.

Watching Details of Shop Management..... 1203
Expansion Test of Kewanee Unions..... 1204
Mill Motors for Auxiliary Drives..... 1205
Combination Punch and Shear..... 1205
New England Foundrymen's Association..... 1205
Mixtures for Chilled Car Wheels..... 1206
Hand Power U Bender..... 1210
Southwark Foundry Under New Control..... 1210
Geared Steam Turbine for the Rolling Mill..... 1211
A Sweeping Anti-Injunction Bill..... 1213
Financiers Inspect the Bethlehem Steel Works..... 1215
Workmen's Compensation in Indiana..... 1215
Collapsible Hand-Rails on Panama Canal Lock Gates..... 1215
The Farrow Spike Machine..... 1216
Brooklyn Power Plant of American Sugar Refining Company.. 1218
Electrically Operated Valve Equipment..... 1218
The Parkesburg Iron Company's Operations..... 1218
Tests of a Reversing Rolling Mill..... 1219
Use of Alternating Current in Unloading Coal..... 1222
Pittsburgh and Vicinity Business Notes..... 1223
Newark Industrial Exposition..... 1223
The Consolidations and Iron and Steel Prices..... 1224
The Ubiquity of Tin Plate..... 1225
A New Anti-Injunction Bill..... 1226
To Abolish the Bureau of Trade Relations..... 1226
A Chicago District Steel Plant..... 1226
Steel Corporation Orders, 5,664,885 Tons..... 1227
Iron Ore Docks on the Lakes..... 1227
The Iron and Metal Markets..... 1228
Heavy Orders for Motor Trucks..... 1239
Personal 1240
Obituary 1240
The Steel Corporation Dissolution Suit..... 1241
The Joint Machinery Jobbers' Meeting..... 1243
A New Record for Melting Furnaces..... 1245
First Shipment of Electric Pig Iron from California..... 1245
The Machinery and Supply Jobber..... 1245
Strange Blast Furnace Explosion at Cleveland..... 1247
Stove Manufacturers' Meetings..... 1247
Philadelphia Foundry Foremen's Association..... 1247
Massillon Iron & Steel Company's Reorganization..... 1247
The Machinery Markets..... 1248

The Consolidations and Iron and Steel Prices

The well known charts of *The Iron Age*, showing by plotted curves the fluctuations in prices of iron and steel products over a period of years, were introduced last week as evidence in the suit of the Government for the dissolution of the United States Steel Corporation. The fact that the attorneys on either side found in these charts support for opposing contentions as to the effect of consolidations on market prices might be taken as another confirmation of the reputed flexibility of statistics when used to reinforce argument. It rather illustrates the necessity of a full statement of the causes operating to produce the figures in question if they are to be interpreted correctly.

More than once the danger has been pointed out of a *post hoc propter hoc* construction of a given set of facts—of saying that one phenomenon caused another because it preceded it. The forming of consolidations in the iron trade in 1898 and 1899 might have been the cause of advances in prices of iron and steel products which carried the chart curves for the latter year to the highest points touched in the past 25 years. On the other hand both the consolidation movement, which was so revolutionary a feature of our iron and steel history for 1899, and the sensational advances in prices in that year may have been products of common causes, without any well defined relation between them of cause and effect. This really appears to have been the case.

Without going at length into the conditions which shaped the course of the industry in 1899, when most of the consolidations were formed which are now subsidiaries of the United States Steel Corporation, it is sufficient to recall that in that year the starveling consumption of iron and steel for the years from 1893 to 1898 gave place to a demand that strained every resource of production. It was like the bursting of a dam under the pressure of an accumulated flood. Postponed demand at last asserted itself. No small factor in the increased purchasing power of the country was the remarkable demand abroad for our farm products in 1897 and 1898, the price of wheat steadily advancing until in the early months of 1898 it reached $1.85 a bushel.

While 1899 will be remembered as the year of iron trade consolidations, the American Steel & Wire Company of Illinois, the Federal Steel Company and the American Tin Plate Company having led the way in 1898, it is also conspicuous as the year in which, under excited buying, manufacturing consumers of iron and steel put up prices upon themselves in a supreme effort to get enough material to meet the demand for their own products. Pig iron, in which there was the freest competition, advanced along with rolled steel, Bessemer iron going from $9.75, Pittsburgh, in early 1898 to $24.90 in November, 1899. Steel billets, which were $14.50, Pittsburgh, in July, 1898, rose rapidly in 1899 to $38.75. The advance began in late 1898. The fact was that the building of new capacity had been held back by the destruction of all industrial values that had run riot for nearly six years. Then came the boom of 1899 with conditions that seemed to have been fairly shaped to the hands of the consolidation promoters. It is to be remembered in connection with the sensational advances of 1899, however, that the very high prices were paid on a relatively small percentage of the year's output. For most of the first half of the year

the mills were running on business taken late in 1898, and as prices soared large contracting ceased and buyers followed the market from month to month.

It is no indictment of the consolidations to say that since they came into the iron trade prices have not gone back to the level of 1897 and 1898, though in fact they came perilously near it last November. The prices of 1897 and 1898 were calamitous and consumers of iron and steel want no return of them. On the other hand the trade has not wanted and has not had any return of the high peaks of the curves for 1899 that give that year its marked isolation on the price chart.

It is not an easy matter to appraise the influence of the consolidations upon prices of iron and steel in the years following 1899. The troughs of 1904 and of the years since the panic of 1907 would have been deeper but for their policy of conserving values when the industry was under strain. It is equally evident that in a modified way the sharp peaks of 1899 would have been repeated in 1892 and in 1895, 1896 and 1897 but for the effort put forth to prevent a runaway market. If it be complained that average prices of steel products were high enough in the first ten years of the Steel Corporation's life to pay out of the industry the enormous profits of the promotions of 1898 to 1901 and dividends on hundreds of millions of watered stock, it is also to be said that due to this scale of prices and profits competition has been built up which gives to the consumer the low prices he now enjoys—if he really enjoys them. Somehow middle ground should be found on a basis, say, of 1.20c. and 1.25c. for finished steel rather than the 1.40c. and 1.50c. levels of the co-operative regime. If there be no such rational way out, then the alternative is an endless repetition of feast and famine, and in the price charts the alternation of peaks and troughs, expressing in graphic form the rule of unlimited competition.

The Ubiquity of Tin Plate

The American production of tin plate has doubled in a decade, and with respect to this doubling some interesting history could be written were precise data available as to the quantity consumed in different channels, for a decade ago relatively little tin plate was consumed except in the manufacture of food products cans. To-day the case is altogether different. The manufacture of bottle caps, for instance, consumes about 600,000 boxes annually, representing about 4 per cent. of the total tin plate production, and nothing could be much more insignificant from a tonnage standpoint than a single bottle cap. It is the use of tin plate in articles which enter so intimately into the life of the entire population that rolls up the tonnage. Last year's tin plate output is estimated at about 750,000 gross tons, or not far from 17,000,000 base boxes, a base box being 112 sheets, 14 x 20 inches, or 31,360 square inches. Those with a fondness for figures may be interested in knowing that 200 boxes involve an area of one acre, and that last year's production was equivalent to about 133 square miles, which emphasizes the ubiquity of tin plate, for a great many boxes, cans, bottle caps, etc., can certainly be made from a surface of 133 square miles.

The striking feature in the development of tin plate consumption has been the growth in the past few years of a very heavy demand outside of the use for packers' cans. The latter use has increased, but at no remarkable rate. The per capita consumption of canned food has, however, increased, and the packing trade never hesitates to ascribe the increase quite largely to the activity of Dr. Harvey W. Wiley, whose work resulted in giving the public greater confidence in canned food products.

While comprehensive data are lacking as to the consumption of tin plate in different uses, the most superficial review of the history of the tin plate making trade cannot escape observing the change which has occurred in tin plate from its being almost wholly a "seasonable" article to its becoming an article which is called for almost uniformly throughout the year. Ten or 15 years ago the tin plate trade depended almost wholly upon the crops, and there were good years and bad years, according as more or fewer of the great crops—corn, peas, tomatoes, blueberries, apples, etc.—were good. To-day the case is different. The success or failure of a given crop makes scarcely a noticeable difference in tin plate consumption. The time was, not many years ago, when the tin plate mills regularly ran full from February 1 or March 1 to midsummer and got along as well as they could the balance of the year. In the late months of the year they accumulated stocks, and even half a dozen years ago it was said that the first day of the year was reached with stocks of at least a million boxes, which would melt away through the heavy shipments in February, March and April. It may be mentioned, however, that the policy of the American Can Company, in selling cans at a price which the individual packer could not meet in his own factory, has had something to do with this change.

As late as 1907 and 1908 this variation in tin plate mill activity was notable. Some records show that the average percentage of operation per quarter was as follows:

	1907.	1908.
First quarter	92	64
Second quarter	98	96
Third quarter	76	73
Fourth quarter	41	60

The above percentages were computed by taking as a basis, 100 per cent., the largest number of mills operated at any one time in the year. At present the condition is altogether different. No year is likely to be found in which for a quarter as few mills will be operated as 75 per cent. of the maximum number operated at any one time in the year.

The American tin plate industry has been established during the past two decades. The McKinley protective duty became effective July 1, 1891, and in the next six months about a thousand tons of tin plate was made in the country. The quarter million ton mark was reached six years later, in 1897; the half million figure was closely approached in another six years, with 480,000 tons in 1903, but not actually passed until 1906. The estimate of 750,000 tons for last year represents the maximum thus far, but 1,000,000 tons is in prospect within a few years. In the first six or seven years the Welsh product was displaced, except for 65,000 to 75,000 tons of "drawback" plate which came into the country practically duty free, to be re-exported later in the form of containers, carpet sweepers, etc. Later small portions of this business were taken by American mills, and a little over a year ago the Welsh tin plate was practically

driven out of the field. To this capture has been added a considerable direct export business, which is now running at the rate of 60,000 to 75,000 tons a year.

A New Anti-Injunction Bill

Elsewhere in this issue will be found the text of the Clayton anti-injunction bill which unexpectedly passed the House of Representatives on Tuesday. This bill was originally introduced by Mr. Clayton, referred to the Judiciary Committee April 22 and was reported out of committee April 29. Large employers of labor will be interested in the provisions of this remarkable bill, as they go considerably further than any of the other anti-injunction bills which have been before Congress in recent years.

Militant labor leaders appear to have been much more successful in imposing their views upon Chairman Clayton than upon any of the other members of Congress who have fathered bills of this kind. Other bills have used specious or somewhat evasive language in handling this delicate subject so that too much antagonism would not be aroused, but the Clayton bill proceeds boldly to take the most advanced position demanded by labor leaders against the use of injunctions wherever their interests are concerned. The last paragraph of the bill would be particularly effective, if it should become law, in preventing any interference with picketing or "peacefully persuading" any person to abstain from working. It would also legalize the boycott. It would enable strikes to be conducted according to the most approved modern methods of crippling an employer.

The sole use of an injunction in the case of a labor trouble is to prevent violence, injury to persons or damage to property. If all strikes were merely confined to the abstention of employees from working, in the belief that employers would not be able to fill their places and would therefore be obliged to accede to their terms, the law would never have to be invoked. A strike would then simply be a test of endurance. The employer would use his best means to secure a force of other workmen, while the striking employees would either temporarily secure other employment or wait patiently for the surrender of the employer to their terms. But this is not the course of procedure. As soon as an employer endeavors to secure a new force of workmen the striking employees resort to violence for the purpose of intimidating those who would take their places or terrorizing the employers into surrendering for fear of serious damage to their property. When local authorities are unable to control violence of this character the injunction is resorted to for the purpose of bringing the power of the Government to bear in suppressing riotous proceedings. The injunction is not a "first aid" to the employer but is practically his last resort. If the ability to invoke an injunction should be wiped out, the riotous and often murderous element among strikers would have one of its most effective restraints removed.

The minority members of the Judiciary Committee have made a most excellent presentation of their objections to this bill. The principal arguments deduced by them are also presented in this issue in connection with the text of the bill. It would have required too much space to give the complete minority report. Enough of it is given, however, to show the opinion of this bill by those who have in the past favored some modification of injunctions as applied to labor troubles. When they refuse to support an anti-injunction bill and characterize it as "vicious" it must indeed be very bad.

To Abolish the Bureau of Trade Relations

WASHINGTON, May 14, 1912.—The unexpected passage in the House of Representatives of an amendment to the legislative, judicial and executive appropriation bill, aimed at the Taft tariff board, promises to develop a very sharp contest in the closing days of the present session of Congress. The amendment is considered of vital importance in connection with the tariff law. The creation of a Bureau of Foreign and Domestic Commerce in the Department of Commerce and Labor, as provided for, would result in the resignation of Secretary of State Knox and Assistant Secretary of State Wilson, it is said, since the scheme to provide a substitute for the present tariff board contemplates also the abolition of the Bureau of Trade Relations of the Department of State. Under the provisions of the bill, as it passed the House, the Bureau of Manufactures and the Bureau of Statistics in the Department of Commerce and Labor would be merged in the proposed Bureau of Foreign and Domestic Commerce.

The new bureau, it is said by those who fathered the measure, is for the purpose of gathering statistics relating to the cost, both in this and in foreign countries, of articles named in the tariff law. The provision which says that such special reports shall be made to the President, or to either branch of Congress, is an important departure, the Taft tariff board being solely under the direction of the President.

Assistant Secretary of State Wilson denies the claim made in the House that the Bureau of Trade Relations in the State Department was designed simply to apply the maximum and minimum provisions of the Payne-Aldrich tariff act. He says that the bill would deprive the department of the services of some dozen foreign service men who carry on the details of important political and commercial diplomatic correspondence with other countries; it would deprive the business men of the country of the advantages all these men are able to give them in the way of accurate information, and would destroy the Bureau of Trade Relations, "whose efficient efforts to expand American foreign trade have brought applause and expressions of appreciation from the manufacturers and business men of the whole country."

A Chicago District Steel Plant

Land Acquired at Hammond, Ind., by the Ferdinand Schlesinger Interests

Announcement is made of the purchase of a tract of 425 acres at Hammond, Ind., in the interest of Ferdinand Schlesinger of Milwaukee and associates. It is generally believed that the project is intended to include the building of blast furnaces, open hearth furnaces and steel finishing mills, the principal product of which will be implement bars and special shapes. It is reported that construction work will be commenced as early as July 1, but so far as authoritative confirmation is concerned, construction work may be postponed considerably beyond that time. The plant site adjoins one of the small lakes of the district and one of the conditions involved in the purchase requires the completion of the Indiana Harbor ship canal to a point available for the use of the plant. Some currency has been given to the statement that the Harrow Steel Spring Company, Kalamazoo, Mich., will ultimately have a hand in the plant to be erected at Hammond or will have a close connection with it.

We are advised by Mr. Schlesinger that the purchase of 425 acres has been made, as reported, and that it is proposed to locate on the tract one or more manufacturing plants requiring the use of large tonnages of iron ore and coal from companies which he controls or with which he is associated. Beyond this nothing has been definitely decided upon regarding the plans of the enterprises contemplated.

In addition to the shipping facilities to be afforded by

the ship canal this location offers railroad service by the New York Central, the Baltimore & Ohio, the Pennsylvania, the Pere Marquette, the Wabash, the Chicago & Northwestern, the Chicago, Milwaukee & St. Paul and the Indiana Harbor Belt Railroad. The associated interests of Ferdinand Schlesinger and Pickands, Brown & Co., Chicago, extend very widely in the ownership of blast furnaces and ore properties, notable among which are the Northwestern Iron Company at Mayville, Wis., and the Newport mine at Ironwood, Mich.

Iron Ore Docks on the Lakes

General Proportions and Details of Capacity Both in Gross Tons and in the Number of Cars of Given Size

A revised record of iron ore shipping docks on Lake Superior and Lake Michigan, bringing the information to May 1, 1912, has been received from W. A. Clark, chief engineer of the Duluth & Iron Range Railroad, Duluth, Minn. Comparing with the record revised to May 1, 1911, and printed in the issue of April 20, 1911, it is noted that the capacity of the docks given in the accompanying table is about 1,440,000 gross tons all told, or about 135,275 gross tons less than the capacity given a year ago. This is due in part to establishing the capacity of the pockets on the basis of the number of carloads each pocket will hold. The docks of five railroads are now placed at 218,215 gross tons less capacity than a year ago, including dock No. 1 of the Chicago & Northwestern, at Escanaba, which is no longer listed; and three railroads are given 82,940 tons additional dock capacity, including 50,000 tons for the steel and concrete docks of the Lake Superior & Ishpeming Railroad at Marquette and 100 additional pockets of the Minneapolis, St. Paul & Sault Ste. Marie Railroad at Superior, Wis.

Record of Ore Loading Docks on the Great Lakes

RAILROAD	Location	Dock No.	Number of Pockets	Capacity per Pocket Cars†	Storage Capacity Gross Tons	Height Water to Center Hinge Hole	Height Water to Deck of Dock	Width of Dock Outside to Outside of Partition Posts	Length of Spouts	Length of Dock	Angle of Pockets	Cubic Feet per Pocket to Bottom of Stringers
Chicago & Northwestern Ry.	Escanaba, Mich.	3	226	2 @ 50–1 @ 25	28,250	31′–2″	52′–8″	37′–0″	27′–0″	1356′	45°–0′	1969
" " "	"	4	250	2 @ 50–1 @ 25	31,250	36′–6″	59′–2″	37′–0″	30′–0″	1500′	45°–0′	2191
" " "	"	5	370	5 @ 50	92,500	37′–9½″	70′–9″	52′–2″	32′–1½″	2200′	45°–0′	4142
" " "	"	6	320	5 @ 50	80,000	40′–0″	70′–0″	50′–2″	30′–0″	1920′	45°–0′	4114
" " "	Ashland, Wis.	1	234	4 @ 50	46,800	40′–0″	70′–0″	50′–2″	30′–0″	1404′	45°–0′	3915
" " "	"	2	234	4 @ 50	46,800	40′–0″	70′–0″	50′–2″	30′–0″	1404′	45°–0′	3915
	Total	...	1634	.....	325,600	.....	.....	.....	.....	.....	.....	.....
Duluth & Iron Range Railroad	Two Harbors, Minn.	*1	208	5 @ 50	52,000	39′–3″	74′–0″	51′–8″	34′–0″	1376′	48°–00′	4075
" " "	"	2	208	3 @ 50	31,200	33′–5″	57′–6″	49′–0″	27′–0″	1280′	38°–42′	3006
" " "	"	3	170	3 @ 50	25,500	40′–0″	66′–0″	49′–0″	27′–0″	1054′	43°–32′	3006
" " "	"	4	168	3 @ 50	25,200	37′–0″	62′–0″	49′–0″	29′–0″	1042′	38°–42′	3270
" " "	"	5	168	3 @ 50	25,200	39′–0″	66′–9″	49′–0″	30′–0″	1050′	43°–32′	3126
" " "	"	*6	148	5 @ 50	37,000	40′–0″	73′–0″	51′–3½″	32′–4″	920′	45°–00′	4272
	Total	...	1070	.....	196,100	.....	.....	.....	.....	.....	.....	.....
Duluth, Missabe & Northern Ry.	Duluth, Minn.	2	384	2 @ 50	38,400	32′–0″	57′–6″	49′–0″	27′–9″	2336′	45°–0′	2368
" " " "	"	3	384	3 @ 50	57,600	40′–7″	67′–½″	59′–0″	27′–9″	2304′	45°–0′	2782
" " " "	"	4	384	4 @ 50	76,800	41′–9½″	72′–6″	57′–0″	30′–1½″	2304′	45°–0′	3867
	Total	...	1152	.....	172,800	.....	.....	.....	.....	.....	.....	.....
Great Northern Ry.	Superior, Wis.	1	374	6 @ 50	112,200	40′–0″	73′–0″	62′–8″	32′–4″	2244′	45°–0′	4972
" "	"	2	350	6 @ 50	105,000	40′–0″	73′–0″	62′–8″	32′–4″	2100′	45°–0′	4972
" "	"	3	326	6 @ 50	97,800	40′–0″	73′–0″	62′–8″	32′–4″	1956′	45°–0′	4972
" "	"	4	302	2 @ 50	105,700	40′–2″	75′–0″	62′–6″	34′–6″	1812′	47°–30′	5347
	Total	...	1352	.....	420,700	.....	.....	.....	.....	.....	.....	.....
Duluth, South Shore & Atlantic Ry	Marquette, Mich.	4	200	2 @ 50	20,000	27′–9″	47′–3″	36′–8″	21′–1″	1200′	39°–45′	1839
" " " "	"	5	200	4 @ 50–1 @ 25	45,000	40′–0″	70′–10″	51′–0″	32′–4″	1236′	45°–0′	3848
	Total	...	400	.....	65,000	.....	.....	.....	.....	.....	.....	.....
Lake Superior & Ishpeming Ry.	Marquette, Mich.	1	200	2 @ 50–1 @ 25	25,000	30′–9″	54′–0″	50′–0″	27′–7″	1200′	38°–40′	2713
" " "	"	*2	200	5 @ 50	50,000	43′–0″	75′–0″	54′–0″	35′–0″	1200′	45°–00′	4590
	Total	...	400	.....	75,000	.....	.....	.....	.....	.....	.....	.....
Minneapolis, St. Paul & Sault Sainte Marie Ry.	Ashland, Wis.	1	314	2 @ 50	31,400	40′–0″	66′–2″	36′–0″	27′–0″	1908′	50°–45′	2435
	Superior, Wis.	1	200	6 @ 50	60,000	42′–5½″	78′–0″	58′–0″	32′–1½″	1200′	47°–00′	4775
	Total	...	514	.....	91,400	.....	.....	.....	.....	.....	.....	.....
Chicago, Milwaukee & St. Paul Ry.	Escanaba, Mich.	1	240	3 @ 50–1 @ 25	42,000	40′–2½″	66′–6″	52′–0″	120@27 120@29	1500′	45°–0′	2900
" " " "	"	2	240	4 @ 50	48,000	40′–11½″	69′–2″	54′–0″	30′–4½″	1500′	45°–0′	3150
	Total	...	480	.....	90,000	.....	.....	.....	.....	.....	.....	.....
Algoma Central & Hudson Bay Ry.	Michipicoten, O't	1	12	.....	.....	34′–0″	43′–4″	25′–0″	22′–6″	311′–9″	44°–0′	.....
Canadian, Northern & Ontario Ry.	Key Harbor, Ont	1	20	2 @ 50	2,000	41′–5″	61′–9″	28′–0″	30′–0″	240′–0″	37°–30′	2315

NOTE.—Storage capacity revised to show working capacity for all docks on same basis.
* Steel and concrete, that at Marquette ready August 1.
† Capacity expressed in the number of cars and capacity of cars.

Steel Corporation Orders, 5,664,885 Tons

The April 30 statement of the United States Steel Corporation's unfilled orders, issued on May 10, showed a total of 5,664,885 tons, an increase of 360,044 tons over the total on March 31. There has been no such amount of orders on hand since the close of 1909, and previous to December 31, 1909, there was no such amount until we come to September 30, 1907, when the total was 6,425,008 tons. The monthly statements of unfilled orders, beginning with January, 1911, are as follows:

April 30, 1912	5,664,885	August 31, 1911	3,695,985
March 31, 1912	5,304,841	July 31, 1911	3,584,085
February 29, 1912	5,454,200	June 30, 1911	3,361,058
January 31, 1912	5,379,721	May 31, 1911	3,113,187
December 31, 1911	5,084,761	April 30, 1911	3,218,704
November 30, 1911	4,141,955	March 31, 1911	3,447,301
October 31, 1911	3,694,328	February 28, 1911	3,400,543
September 30, 1911	3,611,317	January 31, 1911	3,110,919

The totals at the close of the various years have been as follows: 1902, 5,347,523 tons; 1903, 3,215,123 tons; 1904, 4,606,203 tons; 1905, 7,605,086 tons; 1906, 8,498,719 tons (the high record); 1907, 4,624,552 tons; 1908, 3,603,527 tons; 1909, 5,927,031 tons; 1910, 2,674,757 tons; 1911, 5,084,761 tons.

No. 6 blast furnace of the Lackawanna Steel Company's Buffalo plant was blown in this week. The two new open-hearth furnaces now being built by the company are approaching completion and will be ready for operation about July 1.

The Iron and Metal Markets

Steel Companies Buy Steel

Record Output of Open Hearth Plants

Steel Corporation Producing at a 17,750,000-Ton Rate—Pig Iron Quieter

The steel trade continues to respond to the economic forces which, with apparent disregard of political events, have been shaping its course of late. There is evidence of the coming out of long delayed demand, particularly from the railroads, and with more confidence leaders in the industry are now looking for a year of record steel production.

In certain products, as in bars, sheets and wire, the test of recent advances in prices has not been serious from the standpoint of tonnage; but with the requirements of open hearth steel taxing the capacity of melting furnaces the basis for the advances appears substantial.

The insistence of the railroads on so large a tonnage of open hearth steel rails this year, to the exclusion of Bessemer steel, has caused some dislocation of the industry. In the Middle West several steel companies have had to buy 25,000 to 30,000 tons of semi-finished steel in the past three weeks.

Rail orders are still an important factor and not less so because they are more profitable than much of the business now on rolling mill books. The Seaboard Air Line has divided about 17,000 tons between the Tennessee and Bethlehem companies. The Atlantic Coast Line has bought 10,000 tons and the New Haven system has increased its original small order to 27,000 tons —12,000 tons to the Pennsylvania Steel, 10,000 tons to the Bethlehem Steel and 5000 tons to the Lackawanna company. The largest export order is 20,000 tons for the Leopoldina Railroad in Brazil. The Cuba Railway has placed 2000 tons.

Car buying shows a lull, but builders are booked into the fall. An order for 4000 cars has been transferred from a Chicago district plant to Pittsburgh, in part because Western car works are overcrowded and in part because car building material cannot be had for any early delivery from Chicago mills. The McKee's Rocks plant is now operating at 75 per cent. of capacity, turning out 70 cars a day. Locomotive works have been accumulating work quite heavily.

The Eastern market continues to show some deviation from the new Pittsburgh basis for plates and structural material. At the same time the tendency in plates in the Central West is upward, and an instance is reported of a premium for May delivery of plates from a Pittsburgh mill. Warehouse prices of bars and structural steel have advanced $1 a ton at Chicago and $1 to $2 in the Pittsburgh and New York districts.

Specifications have been heavy for bars, plates, shapes, sheets and tin plates. For tin plates $3.40, Pittsburgh, has been quoted lately by some mills to jobbers and large consumers on third quarter deliveries—an advance of 10 cents a box.

Wrought pipe makers have orders that will carry them beyond July 1. Pipe and tube shipments this month have been heavier than in April, and orders booked by large producers in the first four months of the year were 30 per cent. larger than to April 30 last year.

In connection with the Steel Corporation's statement showing 360,000 tons gain in unfilled orders in April it has been stated that the bookings in that month were at prices averaging more than $2 a ton above the level of January prices. The steel ingot production of the corporation is now at the record rate of 17,750,000 tons a year. Eight of the third group of 14 open hearth furnaces at Gary are now operating and the others will be put in by July, adding 1000 tons a day to the Chicago district output.

Pig iron buying has fallen off, particularly in the East. In spite of declining stocks and with production stationary, the holding of advances in foundry iron in the Central West is not easy. This is particularly true of Southern Ohio furnaces. Southern iron is quite firm, however, at $11, Birmingham, for No. 2, and buying of 45,000 tons of pipe iron has caused a further stiffening in that market, several companies asking $11.25 to $11.50 for the last quarter.

An inquiry for 6000 tons of basic iron has come up at Pittsburg and both Bessemer and basic are firmer there.

There is still a deadlock over coke contracts for the second half of the year, furnace companies offering $2 and producers holding for $2.25. The coke situation is easier and the prospect of an anthracite settlement has improved.

The situation in heavy melting steel scrap is strong in all markets. Two Pittsburgh district buyers have been in the market. All forms of old material have been favorably influenced by the recent buying movement in pig iron.

In our export trade Canada is still a prominent figure. From England comes an unusual inquiry, indicating a shortage in skelp in that market.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 15, 1912.	May 8, 1912.	Apr. 17, 1912.	May 17, 1911.
Pig Iron, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.25	$15.25	$15.00	$15.50
Foundry No. 2, Valley furnace	13.25	13.25	13.25	13.75
Foundry No. 2, Southern, Cincinnati	**14.25**	14.00	13.75	13.75
Foundry No. 2, Birmingham, Ala.	**11.00**	10.75	10.50	10.50
Foundry No. 2, at furnace Chicago*	14.50	14.50	14.00	15.00
Basic, delivered, eastern Pa.	*15.00*	15.25	15.00	14.50
Basic, Valley furnace	13.00	13.00	13.00	13.25
Bessemer, Pittsburgh	15.15	15.15	15.15	15.90
Malleable Bessemer, Chicago	14.50	14.50	14.00	15.00
Gray forge, Pittsburgh	**13.90**	13.75	13.65	14.15
Lake Superior charcoal, Chicago	15.75	15.75	15.75	17.00
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh	**21.00**	20.50	20.00	23.00
Open hearth billets, Pittsburgh	**20.50**	20.00	20.00	23.00
Forging billets, Pittsburgh	27.00	27.00	27.00	28.00
Open hearth billets, Philadelphia	23.40	23.40	22.40	25.40
Wire rods, Pittsburgh	25.00	25.00	25.00	29.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	16.00	16.00	15.25	14.75
Iron rails, Philadelphia	16.50	16.50	15.50	16.75
Car wheels, Chicago	14.00	14.00	13.50	12.75
Car wheels, Philadelphia	13.50	13.50	13.00	13.00
Heavy steel scrap, Pittsburgh	13.25	13.25	13.00	12.50
Heavy steel scrap, Chicago	11.75	11.75	11.50	10.25
Heavy steel scrap, Philadelphia	13.50	13.50	13.25	13.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel. Per Pound to Largest Buyers:	May 15, 1912. Cents.	May 8, 1912. Cents.	Apr. 17, 1912. Cents.	May 17, 1911. Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.30	1.30	1.27½	1.30
Iron bars, Pittsburgh	1.25	1.25	1.25	1.30
Iron bars, Chicago	1.25	1.25	1.15	1.22½
Steel bars, Pittsburgh	1.20	1.20	1.15	1.40
Steel bars, tidewater, New York	1.36	1.36	1.31	1.56
Tank plates, Pittsburgh	1.25	1.25	1.20	1.40
Tank plates, tidewater, New York	1.36	1.36	1.31	1.56
Beams, Pittsburgh	1.25	1.25	1.20	1.40
Beams, tidewater, New York	1.36	1.36	1.31	1.56
Angles, Pittsburgh	1.25	1.25	1.20	1.40
Angles, tidewater, New York	1.36	1.36	1.31	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.12½	1.30
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.17½	1.35
Sheets, Nails and Wire, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	1.85	2.20
Wire nails, Pittsburgh	1.60	1.60	1.60	1.80
Cut nails, Pittsburgh	1.55	1.55	1.55	1.60
Fence wire, ann'led, 0 to 9, P'gh.	1.40	1.40	1.40	1.60
Barb wire, galv., Pittsburgh	1.90	1.90	1.90	2.10
Coke, Connellsville, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	$2.25	$2.35	$2.60	$1.45
Furnace coke, future delivery	2.25	2.25	2.25	1.75
Foundry coke, prompt shipment	2.50	2.65	2.75	1.75
Foundry coke, future delivery	2.40	2.40	2.50	2.10
Metals, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	16.25	15.87½	16.00	12.25
Electrolytic copper, New York	16.00	15.75	16.00	12.00
Spelter, St. Louis	6.70	6.65	6.80	5.20
Spelter, New York	6.85	6.80	6.95	5.50
Lead, St. Louis	4.05	4.05	4.12½	4.25
Lead, New York	4.20	4.20	4.20	4.40
Tin, New York	46.12½	45.87½	43.40	43.00
Antimony, Hallett, New York	7.62½	7.75	7.75	9.00
Tin plate, 100-lb. Box, New York	$3.54	$3.54	$3.54	$3.94

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.25c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square ft. take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot, down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $25. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.40; galvanized, $1.70. Carload lots to retailers, annealed, $1.50; galvanized, $1.80. Galvanized barb wire, to jobbers, $1.90; painted, $1.60. Wire nails, to jobbers, $1.60.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, per 100 Lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.70

Structural Material.—I-beam, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in., on one or both legs, ¼ in. and over, 1.25c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.30 to 1.35
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.30 to 1.35
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.30 to 1.35
Tees, 3 in. and up	1.30 to 1.35
Zees, 3 in. and up	1.25 to 1.30
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.30 to 1.35
Deck beams and bulb angles	1.55 to 1.60
Hand rail tees	2.10 to 2.25
Checkered and corrugated plates	2.10 to 2.25

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows:

Blue Annealed Sheets.

Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

Nos. 10 to 12	1.55 to 1.60	.....
Nos. 13 and 14	1.60 to 1.65	.....
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.90 to 2.00
Nos. 12, 13 and 14	2.00 to 2.10
Nos. 15 and 16	2.10 to 2.15
Nos. 17 to 21	2.30 to 2.40
Nos. 22, 23 and 24	2.40 to 2.50
Nos. 25 and 26	2.60 to 2.70
No. 27	2.75 to 2.85
No. 28	3.00
No. 29	3.00 to 3.10
No. 30	3.20 to 3.30

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following:

Corrugated Roofing Sheets by Weight.

Effective April 18, 1912, the rates for painted and formed roofing sheets, per 100 lb., as announced by the American Sheet & Tin Plate Company, are based on the following extras for painting and forming over prices for corresponding gauges in black and galvanized sheets:

	Gauges, per 100 lb.			
Painting.	29	25 to 28	19 to 24	12 to 18
Regular or oiling	...	0.15	0.10	0.05
Graphite, regular	...	0.25	0.15	0.10
Forming				
2, 2½, 3 and 5 in. corrugated	0.05	0.05	0.05	0.05
2 V-crimped, without sticks	0.05	0.05	0.05	...
⅝ to 1¼ in. corrugated	0.10	0.10	0.10	...
3 V-crimped, without sticks	0.10	0.10	0.10	...
Pressed standing seam, with cleats	...	0.15	0.15	...
Plain roll roofing with or without cleats	0.15	0.15	0.15	...
Plain brick siding	...	0.20	...	...
3/15 in. crimped	0.20	0.20	0.20	...
Weatherboard siding	...	0.25	0.25	...
Beaded ceiling	...	0.25	0.25	...
Rock face brick and stone siding	...	0.25	...	...
Roll and cap roofing, with caps and cleats	0.25	0.25	...	...
Roofing valley, 12 in. and wider	...	0.25	0.25	...
Ridge roll and flashing (plain or corrugated)	...	0.65	0.65	0.65

Corrugated Roofing Sheets, with 2½-In. Corrugations, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.30	$3.50
28	$1.35	2.55	22	2.50	3.80
27	1.50	2.60	21	2.70	4.05
26	1.60	2.65	20	2.90	4.25
25	1.80	3.05	18	3.90	5.70
24	2.00	3.15	16	4.70	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought

pipe, in effect from December 1, 1911; galvanized iron pipe, from March 1, 1912:

Butt Weld.

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ in.	74	54	68	49
⅜ in.	75	65	69	53
½ in.	78	68	72	59
¾ to 1½ in.	81	72	75	64
2 to 3 in.	82	75	76	65

Lap Weld.

1¼ and 1½ in.	..	..	68	61
2 in.	79	72	72	63
2½ to 4 in.	81	74	74	66
4½ to 6 in.	80	72	73	65
7 to 12 in.	78	68	71	61
13 to 15 in.	55	..	47	..

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	63
¾ to 1½ in.	79	73	74	65
2 to 3 in.	80	74	75	66

Lap Weld, extra strong, plain ends, card weight.

1½ in.	..	..	66	60
2 in.	76	70	71	63
2½ to 4 in.	78	72	73	66
4½ to 6 in.	77	71	72	65
7 to 8 in.	70	60	65	55
7 to 12 in.	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

¼ in.	65	59	60	52
¾ to 1½ in.	68	62	63	55
2 to 3 in.	70	64	65	57

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	52
2¼ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld
} Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Standard Charcoal Iron.*	
1¼ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2½ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½	Locomotive and steamship special grades bring higher prices.	
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f. o. b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., May 15, 1912.

Specifications against contracts for steel bars, plates and shapes are coming in at an unprecedented rate and mills are getting further behind in deliveries. A further advance in prices in these products of about $1 a ton is looked for between now and June 1. While the makers state they are adhering rigidly to the prices announced April 20, the amount of new business placed since they became effective is relatively small, consumers having been given a chance to cover their requirements and are now filled up to July 1, in some cases to October 1, while certain of the larger interests will buy little material for the remainder of this year. Buyers are importuning the mills for quick deliveries, which they are not able to make, the leading interest not promising deliveries on plates under eight to ten weeks and other mills four to six weeks. The shortage in steel is being more severely felt, the large billet makers here and at Youngstown turning down good inquiries almost every day on which they cannot make the deliveries wanted. Prices 50c. to $1 higher are being quoted on billets and sheet bars, and consumers not covered are having much trouble to find mills that will supply them. Specifications on sheets and tin plate continue very heavy and new buying in sheets is fairly liberal. The local scrap market is strong, dealers asking 25c. to 50c. advance on nearly all grades. There is a scarcity of heavy steel scrap and the market is likely to go higher. Two leading local consumers are reported short of scrap and soon to come in the market. Coke has quieted down considerably, prompt furnace coke being available at about $2.25 per net ton at oven. The advance of $2 a ton in ferromanganese, the third in about a month, is expected to be followed by still higher prices in the near future, as this material is very scarce. The whole situation looks strong in every way.

Pig Iron.—There is a fair amount of small inquiry, and prices are very firm. The merchant furnaces have only a small amount of pig iron available for the next two months, and it is believed that consumption is now running slightly ahead of production and stocks are being steadily depleted. The Brier Hill Steel Company, Youngstown, reports a sale of 15,000 tons of Bessemer iron at $14.50 at furnace, and denies the report that this sale was contingent upon its placing a contract for structural steel for its open-hearth buildings with the leading interest. The higher prices ruling for coke and the scarcity of labor have kept some merchant furnaces out of blast that otherwise would have been running before this, but with an advance of 50c. to $1 now predicted, some of these furnaces will swing into line and become active producers. A leading local consumer is reported to have closed for upward of 2000 tons of No. 2 foundry iron for last half delivery, paying slightly above $13.25, Valley furnace. Forge iron has advanced squarely to $14, Valley furnace, with some sellers asking $13.25 and $13.50. We quote standard Bessemer iron at $14.25 to $14.50; basic, $13 to $13.25; malleable Bessemer, $13 to $13.25; No. 2 foundry, prompt delivery, $13.25, and for last half, $13.50; gray forge $13, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

(*By Telegraph*, May 15).—A definite inquiry is out for 6000 tons of basic for last half delivery, but the buyer is expected to take 18,000 to 20,000 tons if a satisfactory price is made. Indications point to a stiff advance on basic in the near future.

Steel Billets and Sheet Bars.—Some fairly large inquiries for billets are in the market, one consumer inquiring for 12,000 tons of open-hearth billets and another 3000 tons of Bessemer billets. These inquiries have been submitted to two local steel mills and have been turned down, as they could not make deliveries. The Republic Iron & Steel Company and the Youngstown Sheet & Tube Company are also well sold up, and cannot promise deliveries on billets or sheet bars inside of six to eight weeks. We have advanced prices and now quote open-hearth billets $20.50 to $21; Bessemer billets $21 to $21.50; Bessemer and open-hearth sheet bars, $21.50 to $22; axle billets, $25; forging billets, for general forging purposes, $28, all f.o.b. Pittsburgh. Prices on steel at Youngstown are also higher, as follows: Bessemer and open-hearth billets, $21; Bessemer and open-hearth sheet bars, $22.

Ferroalloys.—The shortage in supply of ferromanganese is getting more acute, and another advance of $2 a ton has been made, putting the price to $48.50, Baltimore, effective from May 10. Consumers are paying as high as $55, seaboard, for carload lots for prompt shipment, and we note sales of several cars at that price. A steamer docked at Baltimore May 4 has not been unloaded at this writing on account of a strike of the dock employees. Some of the steel mills report that they are not getting shipments fast enough to keep them fully supplied and occasionally have to buy a car or two and pay premiums. There is a fair new demand for ferrosilicon, and full prices are being obtained. We note a sale of three or four carloads of 50 per cent. for prompt shipment at $70 delivered, and also a sale of 100 tons for June and July delivery at $69. Prices on the lower grades of ferrosilicon are stronger and an early advance is expected. We quote 50 per cent. in lots up to 100 tons, at $70; over 100 tons to 600 tons, $69, and over 600 tons, $68, Pittsburgh. The lower grades are ruling at about $20 for 10 per cent.; $21 for 11 per cent.; $22 for 12 per cent., f.o.b. cars at furnace, Ashland, Ky., or Jackson, Ohio. The demand for ferrotitanium is reported active, and we quote 8c. per lb. for carload lots; 10c. per lb. in 2000-lb. lots and over, and 12½c. per lb. in lots up to 2000 lb.

Wire Rods.—The market on wire rods is showing a firmer tone. Several makers report they are having trouble in getting steel promptly in large enough quantities to take care of their wire rod commitments. No large inquiries have been in the market for some time, but there is a fair amount of small buying. We note a sale of 175 tons of open-hearth rods at $25.50, Pittsburgh. On very large lots it is probable that $25 could be done, but on small lots makers are quoting $25.50 to $26. We therefore quote Bessemer, open-hearth and chain rods at $25 to $26, the price depending on the quantity involved.

Muck Bar.—The two leading consumers of muck bar in this district are A. M. Byers & Co. and Spang, Chalfant & Co., but they have recently increased their puddling facilities and are making at present enough to supply their own needs. For this reason new inquiry is light. The higher prices ruling on gray forge iron have stiffened up the muck bar market, and we now quote best grades of muck bar, made from all pig iron, at $29 to $29.50, Pittsburgh.

Skelp.—A particularly heavy demand is reported for line pipe, and this is reflected in a more active demand for grooved and sheared iron skelp. The mills are filled up for some time ahead. We have advanced our prices on iron skelp from $1 to $2 per ton. We note a sale of 600 tons of grooved iron skelp at about 1.60c. delivered. We quote grooved steel skelp at 1.15c. to 1.17½c.; sheared steel skelp, 1.20c. to 1.22½c.; grooved iron skelp, 1.55c. to 1.60c.; sheared iron skelp, 1.65c. to 1.70c., delivered at buyer's mill, Pittsburgh district.

Steel Rails.—The Ohio works of the Carnegie Steel Company at Youngstown, which had been on open-hearth rails for some weeks, is now on sheet bars. Specifications against contracts for standard sections are coming in quite freely, and the new demand for light rails is heavier than at any time since prices were advanced. The Carnegie Company received new orders and specifications against contracts in the past week for about 2500 tons of light rails. We quote splice bars at 1.50c. per lb. and rails as follows: Standard sections, 1.25c. per lb.; 8 and 10-lb. light rails, 1.29½c.; 12 and 14-lb., 1.20c.; 16 and 20-lb., 1.15c.; 25, 30, 35, 40 and 45-lb., 1.10c., in carload lots, f.o.b. Pittsburgh.

Structural Material.—Inquiries have been rather light. The McClintic-Marshall Construction Company has taken 700 tons for a new building for the East End Savings & Trust Company, the American Bridge Company has taken 900 tons for a department store and the Fort Pitt Bridge Works has taken 1100 tons for the arch centers for bridges for the Lackawanna Railroad. Low prices continue to be made on fabricated work, and from some sources reports come that plain material is still being obtained at less than 1.25c. at mill. This statement is denied by the two local structural makers, who claim that they are not entering any new business under this price. We quote beams and channels up to 15 in. at 1.25c, Pittsburgh.

Plates.—Reports that 30,000 to 40,000 cars have been placed in the past two or three weeks are officially denied by local car builders who say that new inquiries have quieted down. The Pressed Steel Car Company has taken 300 steel hopper cars for the Buffalo Creek & Gauley Railroad. This company is operating its McKees Rocks works to about 75 per cent. of capacity, turning out about 70 cars per day. Active inquiries include 700 steel ballast cars from the Chicago, Milwaukee & St. Paul; 2500 steel gondolas from the Illinois Central; 1000 steel gondolas from the Chicago, Burlington & Quincy; 100 steel ballast cars and 400 steel gondolas from the Coal & Coke Railway; 125 ore cars and 50 steel gondolas from the American Steel & Wire Company; 50 hopper, 50 box cars and 50 gondolas from the India Creek Valley Railroad, and 150 ore cars from the Northern Pacific. The Norfolk & Western is in the market for 64 passenger, baggage and mail cars; the Pittsburgh Railways for 50 steel street cars and 50 trailers, and the Birmingham & Garfield Railroad for 25 steel ore cars and 30 gondolas. Recent announcements of orders placed by the Seaboard Air Line and the Louisville & Nashville refer to contracts placed by these railroads several months ago. Steel car companies are specifying heavily for steel plates and steel bars, but are not as well filled up and have not as much business ahead as some reports would indicate. Local plate mills are filled over the next two or three months and the market is firm. We quote ¼ in. and heavier plates at 1.25c. Pittsburgh.

Sheets.—There is no let up in volume of specifications for sheets, which are probably heavier than ever before in the history of the sheet trade, but the amount of new buying is relatively small, as nearly all consumers placed heavy contracts some time ago. Some of the leading mills are considerably behind in deliveries, two of them not taking in new orders for shipment within eight to ten weeks from date of contract. The market is firm, No. 28 black sheets being held at 1.90c. to 1.95c. and galvanized sheets from 2.90c. to 3c., Pittsburgh, the lower prices being absolutely minimum.

Tin Plate.—Within the last few days some of the larger tin plate mills have been quoting on inquiries for third quarter on the basis of $3.40 to jobbers and large consumers, this being a practical advance of 10c. per box over prices recently quoted. With heavy advances in pig tin, the cost of making tin plate has been increased, and the mills feel that they should get more money for their product. Specifications continue very heavy, and claims are still being made that there will be a shortage in the supply of tin plate this summer if the country is favored with heavy fruit crops. The can makers are making up the largest stocks they have ever had. We quote tin plate at $3.40 per base box for third quarter delivery, but it might be possible to place small orders at $3.30 for delivery up to July 1.

Iron and Steel Bars.—The volume of specifications against contracts for steel bars continues very heavy. Some of the leading mills are now considerably behind in deliveries, and the situation in this respect is not likely to improve. The new demand for steel bars is only fair, as nearly all consumers are covered by contracts for a long period ahead. New demand and specifications against contracts for iron bars are heavier, car builders specifying quite freely against contracts, and shipments this month will show an increase over April. We quote steel bars at 1.20c. on new orders and common iron bars 1.25c. to 1.30c. f.o.b. Pittsburgh.

Hoops and Bands.—New demand is fairly heavy, and makers state that specifications against contracts for both hoops and bands are coming in freely. Shipments this month will be in excess of April. We quote steel bands at 1.20c., with extras as per the steel bar card, and steel hoops at 1.25c. to 1.30c., the lower price being absolutely minimum.

Rivets.—The new demand and specifications are heavier than for some months, and leading makers report they are well filled up with business over the next two or three months. Prices are very strong. We quote structural rivets at $1.50 to $1.55 per 100 lb. base, and boiler rivets at $1.60 to $1.65 per 100 lb. base, in carload lots f.o.b. cars, Pittsburgh. Small lots bring from 5c. to 10c. per 100 lb. advance over these prices. Prices on all kinds of bolts are very strong, ruling from 10 to 15 per cent. higher than two or three weeks ago.

Shafting.—New demand is more active, and makers state that specifications against contracts are heavier in volume than for some months. Prices are firmer, and an advance in shafting is looked for in the near future. We quote cold-rolled shafting at 67 per cent. off in carloads and 62 per cent. in less than carloads delivered in base territory.

Spelter.—The market has been quiet and prices have gone off slightly. We quote prime grades of Western at about 6.72½c., Pittsburgh.

Railroad Spikes.—General specifications are coming in quite freely. We quote base sizes at $1.40 per 100 lb., Pittsburgh.

Wire Products.—Makers of wire and wire nails report that specifications show some betterment, and the volume of new business is also showing an increase. The usual spring spurt in demand for wire and wire nails was not realized this year on account of the unfavorable climatic conditions, but manufacturers look for a heavy volume of business in the fall. As yet very few wire nails are being shipped out on the $1.60 basis, but most contracts taken at $1.50 have been specified for, and the larger part of the shipments from the mills are now on the $1.55 basis. The mills state they are absolutely maintaining regular prices on wire nails and wire, but some of the jobbers are slightly shading the market, having stocks on hand which they are desirous of moving out more freely. We quote wire nails at $1.60; cut nails, $1.50; galvanized barb wire, $1.90; painted, $1.60; annealed fence wire, $1.40, and galvanized fence wire, $1.70, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—A feature of the pipe market at present is the heavy demand for iron pipe, the mills being well filled up to July 1, with new orders coming in freely. The jobbing pipe trade feels that the chances for an advance in prices are good, and in some cases are endeavoring to cover their requirements for the remainder of the year, but the mills are turning down this business, and as a rule are refusing to sell at present discounts beyond July 1. Several mills report their actual orders so far this year 30 per cent. or more in excess of the same period last year. We also note a very heavy new demand for oil country goods, and shipments of these products by the mills are very heavy. Line pipe has been quiet, the only active inquiry in the market being one for 10 miles of 12 in. for shipment to a lead and zinc company in Missouri. The National Tube Company has taken 25 miles of 8-in. steel line pipe for a gas line in California. Shipments of tubular goods this month by the mills promise to be heavier than in April, and all the leading pipe

mills are pretty well filled up to July 1. It is stated that regular discounts on iron and steel pipe are being pretty firmly held, but some low prices continue to be made on line pipe.

Boiler Tubes.—There is not much new buying in locomotive or merchant tubes, the large buyers having covered their requirements some time ago up to July 1. Specifications against these contracts are coming in quite freely. The recent advance of $3 a ton in seamless steel tubing was made mainly for the reason that the mills were filled up.

Iron and Steel Scrap.—The market on all kinds of scrap is very strong, and prices on some grades are 25c. to 50c. a ton higher. The scrap on the Baltimore & Ohio list was awarded last Friday, but very little of it came to local dealers. The Norfolk & Western list, which closed Tuesday, did not contain as much material as usual. It is stated that a leading interest has inquiries out for a round tonnage of heavy steel scrap. We note sales of 1500 tons of heavy steel scrap for Sharon and Youngstown delivery at $13.25; 1500 tons of cast iron borings at $9.75; 1300 tons of turnings at $10 to $10.25; 300 tons No. 1 busheling scrap at $12.50 and 200 tons of old car wheels at $13.50, all delivered. Dealers are quoting as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	$13.25
No. 1 foundry cast	$12.75 to 13.00
No. 2 foundry cast	10.75 to 11.00
Bundled sheet scrap f.o.b. consumers' mill, Pittsburgh district	11.25 to 11.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.75 to 14.00
No. 1 railroad malleable stock	11.75 to 12.00
Grate bars	9.50 to 9.75
Low phosphorus melting stock	15.00
Iron car axles	21.00 to 21.50
Steel car axles	15.75 to 16.00
Locomotive axle	22.00 to 22.50
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.00 to 8.25
Old car wheels	13.00 to 13.25
*Cast iron borings	9.75 to 10.00
*Machine shop turnings	10.00 to 10.25
†Sheet bar crop ends	14.00 to 14.25
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	13.00 to 13.25
Heavy steel axle turnings	10.25 to 10.50
Stove plate	9.50 to 9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Coke.—The market has been quiet in the past week, and, with a heavy supply, prices on standard grade furnace coke have gone off slightly, and it is now obtainable at $2.25 to $2.35 per net ton at oven. A local dealer reports a sale of 6000 tons for prompt delivery at $2.20. Several fairly large inquiries are in the market for furnace coke for last half shipment, on which about $2.25 is being quoted. We quote standard makes of furnace coke for prompt shipment at $2.25 to $2.30 per net ton at oven, and 72-hr. foundry coke for spot shipment at $2.65 to $2.90.

The Carnegie Steel Company has advanced prices on merchant steel bars to 1.55c. and on plates and shapes to 1.65c., for delivery from its Pittsburgh warehouse.

B. S. Stephenson, formerly of the Detroit office of M. A. Hanna & Co., has been appointed Pittsburgh representative of the same firm, succeeding Eliot A. Kebler, resigned.

Chicago

CHICAGO, ILL., May 15, 1912.—*(By Telegraph.)*

Pig Iron.—A moderately active demand is observed for Northern iron, particularly malleable and basic. An inquiry for 5000 tons—one for 3000 tons and another for 1000 tons—are expected to be placed this week. A considerable number of smaller requirements are also about to be covered. To all appearances local furnaces are adhering with considerable firmness to their price of $14.50, f.o.b. furnace, and consumers who need iron seem content to pay this price. There is some tentative inquiry for which prices slightly below the market are being sought by buyers. The demand for Southern iron is much lighter, and there appears to be some variation in the prices asked. It is stated that No. 1 iron has been sold for last half at $12, Birmingham, and No. 2 at $11.50, but there can be no question as to the possibility of obtaining iron freely at $11. The Iroquois Furnace Company blew in the first of its two new stacks May 13. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$15.75 to $16.50
Northern coke foundry, No. 1	15.00
Northern coke foundry, No. 2	14.50
Northern coke foundry, No. 3	14.25
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.85
Southern coke, No. 2 foundry and No. 2 soft	15.35
Southern coke, No. 3	15.10
Southern coke, No. 4	14.35
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	14.50
Standard Bessemer	16.75
Basic	14.75
Jackson County and Kentucky silvery, 6 per cent	16.90
Jackson County and Kentucky silvery, 8 per cent	17.90
Jackson County and Kentucky silvery, 10 per cent	18.90

(By Mail)

The greatest effort of the local mills is directed toward satisfying customers regarding delivery. The situation has become quite general in which new business is being declined where delivery before the latter part of July or the middle of August is requested. While specifications are exceedingly heavy, and for most of the local sales offices April was the record month of the year, new business is expected to be light for the next few months. Mill prices for finished steel are exceedingly firm on a basis of 1.25c., Pittsburgh, for plates and shapes and 1.20c. for bars, with a likelihood of $1 a ton more being asked where new business is accepted under pressure. Store prices have been advanced $1 a ton. The leading interest has also advanced its mill price on spikes $1 a ton. Reports show a heavy bar iron tonnage taken the past week at prices ranging from 1.20c. to 1.30c., but at this writing the market seems to have advanced to a firm minimum of 1.25c.

Rails and Track Supplies.—Among the rail orders recently placed were 2000 tons by the St. Paul, 1000 tons by the Monon, placed with the Cambria Steel Company, and 500 tons by the Rock Island Railroad, bought from the Pennsylvania Steel Company. The Pere Marquette is also understood to have closed for 14,000 tons for which it was negotiating. The leading interest has advanced prices for spikes $1 a ton and 1.55c. is now the minimum quotation. We quote standard railroad spikes at 1.55c. to 1.65c., base; track bolts with square nuts, 1.95c., base, all in carload lots, Chicago; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.20c. to 1.25c.; 16 to 20 lb., 1.25c. to 1.30c.; 12 lb., 1.30c. to 1.35c.; 8 lb., 1.35c. to 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—The largest item among the fabricating contracts placed last week was 2377 tons for the Second National Bank Building, Toledo, Ohio. The Indiana Bridge Company, Muncie, Ind., will furnish 148 tons for a coal storage plant for the United Coal Mining Company, and the American Bridge Company 131 tons for a seed warehouse and elevator at Milwaukee. Specifications from car builders for material applying on recent car orders are crowding the mills considerably beyond their rated output and their supply of open hearth steel. It seems likely that the substitution of Bessemer steel for open hearth will be resorted to in many instances in order to obtain deliveries. Store prices on shapes have been advanced $1 per ton. We quote for Chicago delivery, mill shipment, on plain shapes, 1.43c., and from store 1.70c.

Plates.—The mill plate business is largely a problem in caring for the requirements of car builders, with a fair demand coming from bridge girder work and boiler makers. Local mills are sold up for a period so far in the future that demands for prompt shipment have little likelihood of being supplied except from store. As a result warehouse stocks have been heavily drawn upon. We note an advance of $1 a ton in the store price of plates and quote for Chicago delivery, mill shipment, 1.43c. and from store 1.70c.

Sheets.—With the more important mills unable to make delivery of sheets before the middle of July other mills are finding little difficulty in taking the business that is offered. As a result prices are more uniform and the general market is more firmly established. We quote Chicago delivery as follows: Carload lots, from mill, No. 28 black sheets, 2.08c. to 2.13c.; No. 28 galvanized, 3.13c. to 3.18c.; No. 10 blue annealed, 1.58c. to 1.63c. Prices from store are: No. 10, 1.95c.; No. 12, 2c.; No. 28 black, 2.30c., and No. 28 galvanized, 3.45c.

Bars.—During the past week the bar iron situation acquired additional strength, based on unusually active buying. Sales aggregating between 5000 and 6000 tons are noted, which business was placed at prices ranging from 1.20c to 1.30c. The minimum quotation in this market is 1.25c. A better demand for hard steel bar products is reported, and soft steel bar specifications continue heavy. Bar prices out of store are $1 a ton higher. We quote as follows: Bar iron, 1.25c.; hard

steel bars, 1.20c. to 1.25c.; soft steel bars, 1.38c., and from store, soft steel bars, 1.60c., Chicago.

Rivets and Bolts.—The demand for rivets and track bolts is taxing the local capacity. Machine and carriage bolts are being specified liberally by manufacturers, especially in the implement trade. We quote as follows: Carriage bolts up to ⅜ in. x 6 in., rolled thread, 80 and 15; cut thread, 80 and 10; larger sizes, 75 and 10; machine bolts up to ⅜ in. x 4 in., rolled thread, 80 and 20; cut thread, 80 and 15; larger sizes, 75 and 15; coach screws, 80 and 20; hot pressed nuts, square head, $6.40 off per cwt.; hexagon, $7.30 off per cwt. Structural rivets, ½ in. and larger, 1.68c. base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Old Material.—An exceptionally active demand for nearly all forms of old material continues in this district, and despite the heavy influx of scrap the market remains at its high level and even with some slight advances. Rather more than the normal amount of old material is being shipped into this market at the present time because of the relatively high local prices. Melters are experiencing difficulty in handling incoming shipments because of the congestion of cars at their plants. It is understood that on the large Santa Fe list offered last week little or no scrap was sold. New offerings include lists from the Lake Shore & Michigan Southern, Illinois Central, and Chicago, St. Paul, Minneapolis & Omaha, the last named offering 1500 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	13.25 to 13.75
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	11.75 to 12.25
Frogs, switches and guards, cut apart	11.75 to 12.25
Shoveling steel	11.75 to 12.25
Steel axle turnings	9.50 to 10.00

Per Net Ton.

Iron angles and splice bars	$13.75 to $14.25
Iron arch bars and transoms	15.25 to 15.75
Steel angle bars	11.75 to 12.25
Iron car axles	19.25 to 19.75
Steel car axles	15.75 to 16.25
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
Steel knuckles and couplers	11.00 to 11.50
Steel springs	11.25 to 11.75
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	7.50 to 8.00
Cast and mixed borings	6.75 to 7.00
No. 1 busheling	10.25 to 10.75
No. 2 busheling	7.75 to 8.00
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.00 to 12.50
Stove plate and light cast scrap	10.25 to 10.75
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Cast Iron Pipe.—The awards of 3000 tons of pipe at Cleveland and 1100 tons at Cincinnati, Ohio, while not formally made, have been practically assured to the leading interest. At South Bend 400 tons was purchased and at Sioux City 300 tons. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $27; 6 to 12 in., $25; 16 in. and up, $24.50, with $1 extra for gas pipe.

Wire Products.—While the leading interest reports a very active demand for wire products, particularly nails and fencing, with heavy shipments, some of the independent makers would be glad to get additional business. In some directions the needs of distributers are sufficiently insistent to require their purchasing out of warehouse stock, a condition which has not obtained for the large buyers for many months. We continue to quote as follows: Plain wire, No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78 to $1.83; galvanized, $2.08; polished staples, $1.83; galvanized, $2.13, all Chicago.

Philadelphia

PHILADELPHIA, PA., May 14, 1912.

A moderate volume of business is moving in all iron and steel products, with prices comparatively well maintained. While purchases of foundry iron have not been heavy, considerable inquiry for forward shipment is noted. Further purchases of basic iron have followed recently reported sales. The volume of business in rolling and forging billets is larger and prices have an advancing tendency. More business in structural material is reported, while a better run of orders for heavy plates is noted. Makers of iron bars are considerably firmer as to prices, although buying continues light. Producers and consumers of coke are still apart as to prices for furnace coke for second half delivery. The old material market is quiet. Eighty per cent. ferromanganese has been advanced to $48.50, Baltimore, for last half delivery.

Iron Ore.—The first of the season's shipments of Wabana ore to consumers in this district came down from Newfoundland this week, being a cargo of upward of 13,000 tons. The ore market is extremely quiet, there being practically an entire absence of new business. Importations during the week, in addition to the above cargo were 12,500 tons of Swedish ore.

Pig Iron.—Statistics compiled by both the Eastern and Virginia Pig Iron associations show a steady betterment in the position of producers. In both districts unfilled orders showed a considerable increase during April, while stocks declined sharply. In the Virginia districts stocks on furnace yards are now lower than they have been at any time since August, 1910. At the meeting of the Eastern Association held last week, producers were of a more cheerful disposition. Owing to uncertainty as to coke prices, there has been a pretty general disposition to withhold quotations for pig iron for extended forward delivery. Interest in steel making irons has again become more pronounced. Following the sale of 15,000 tons for shipment extending into the third quarter, to an Eastern melter, at $15, delivered, referred to several weeks ago, several sellers have receded from their determined effort to hold at $15.25 to $15.50 for such delivery, and the same buyer took on last week two 5000-ton lots for third quarter shipment at $15. Central Pennsylvania melters have been in the market for several thousand tons of this grade and rumors are heard that some business has been quietly closed at prices above the minimum. Another Eastern consumer is again feeling the market, but it is stated that no definite tonnage has been named. A somewhat better movement in standard analysis low phosphorus iron is reported, although the business is mostly in small lots, as high as $19.75, delivered here, being done, but $19.50 to $20 about represents the market, dependent on customer and quantity involved. A fair volume of business is moving in the higher foundry grades, mostly in small quantities for prompt shipment, for which standard brands command from $15.25 to $15.50, delivered. Considerable inquiry for third quarter and last half is before the trade, but few quotations for extended deliveries come out, owing largely to the deadlock on furnace coke for last half. Definite inquiries for numerous moderate and large lots are reported, including one for 1000 to 2000 tons of low silicon foundry from the local locomotive builder. A somewhat better movement in Virginia foundry iron is noted, but sales are confined to small lots for prompt shipment, with an occasional few hundred tons for delivery over the next two or three months, for which No. 2 X foundry is firmly established at $13, furnace, with No. 2 plain in instances at $12.75. Cast iron pipe makers, both in this district and in Virginia, are negotiating for further supplies of low grade iron. One Virginia maker has inquiries out for 3000 tons of No. 3 and forge grades, while pipe makers in this district are negotiating for varying quantities of off iron, but are disinclined to pay prices asked, which range close to $14.75 delivered. Rolling mill forge iron is quiet, pending negotiations in instances having been discontinued. Sellers' positions generally are strong. Consumption, from statistics available, is in excess of production, and plans for the blowing in of several furnaces, including Brooke in the Schuylkill Valley and Oxford in New Jersey, are under way. Pulaski in Virginia, which has been relined, was blown in May 7. The following range of prices is quoted for standard brands delivered in buyers' yards in this district:

Eastern Pennsylvania No. 2 X foundry	$15.25 to $15.50
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia No. 2 X foundry	15.80 to 16.00
Virginia No. 2 plain	15.55 to 15.75
Gray forge	14.50 to 14.75
Basic	15.00 to 15.25
Standard low phosphorus	19.50 to 20.00

Ferroalloys.—Foreign makers of 80 per cent. ferromanganese have announced a further advance in quotations, $48.50, Baltimore, now being named for second half delivery. As a result of the new basis, business has come to a temporary standstill. Small lots of prompt ferromanganese have been sold at $54, seaboard. Very little movement in ferrosilicon is reported, one broken lot inquiry for 50 per cent. being the only business reported in this district.

Billets.—A larger volume of business is moving, both in rolling and forging billets, and Eastern mills

are less able to make urgent deliveries. Considerable new tonnage in forging billets for Western shipment has been entered by one Eastern producer. The bulk of the orders entered are for small and moderate lots, makers not being inclined to contract in view of the hardening tendency of prices. On ordinary business the following quotations apply, although the minimum is not always available: Basic open-hearth rolling billets, $23.40 to $24.40; forging billets, $27.40 to $29.40, according to specifications, delivered in buyers' yards in this district.

Plates.—A very fair volume of new business has developed, while current miscllaneous orders continue to be received in good number. Operations continue at a high rate, averaging 90 to 95 per cent., and mills would no doubt be run up to maximum capacity but for the difficulty of getting sufficient labor. Inquiries are noted for 12,000 tons of ship plates to cover estimates for four vessels on which shipbuilders are figuring. Negotiations are also pending for 2000 tons of tank plates for prompt delivery. General specifications are coming out freely and some mills are less able to make prompt shipments. While 1.40c. is the usual minimum for ordinary plates for prompt delivery some makers who firmly hold that minimum are losing business, which might be taken to indicate that all sellers are not strictly maintaining that price.

Structural Material.—A somewhat better movement is noted, although the bulk of the orders are confined to small lots. The Hotel Vendig, involving 1600 tons of fabricated structural work, has been taken by the Cambria Steel Company, Doyle & Co. having the general contract. The Pennsylvania Railroad has an inquiry out for a bridge over the Monongahela River requiring about 750 tons. Plans for some large buildings are under way in the South, while several hotel projects are under negotiation in this district. Makers of plain shapes are somewhat better engaged, and while 1.40c., delivered, is now generally quoted on small orders 1.35c. is still available on desirable business.

Sheets.—Orders have been coming in more freely, but individually small, as a rule, and usually for early shipment. Eastern mills' order books are in decidedly better shape, and operations are close to capacity basis. Quotations are somewhat firmer at 2.05c. to 2.10c., delivered here, for No. 28 Western sheets. Eastern mills making smooth, loose rolled sheets easily obtain, however, an advance of ¼c. to ½c. per lb.

Bars.—Notwithstanding quiet market conditions Eastern iron bar mills are in some instances asking higher prices for miscellaneous orders, but for desirable business 1.30c., delivered in this district, can still be done. Mills are receiving specifications on old orders and are moderately well engaged. New business in steel bars is not very active, although prices are firm at 1.35c., delivered here. Specifications against old contracts keep mills actively engaged.

Old Material.—Irregularity continues to be noted in some lines and the market on the whole, while comparatively strong, has a tendency to drag. Several consumers of heavy melting steel are practically out of the market and consider only bargain lots; on the other hand the top of the market is reported to have been paid for a round lot by a consumer who is not paticularly well supplied with that grade of scrap. A congestion in the deliveries against a recent heavy purchase of wrought turnings has somewhat weakened the market for that grade of material, and prices are lower. Dealers are not offering material very freely, awaiting a more active general demand. The following range of prices about represents the market for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap and crops	$13.50 to $14.00
Old steel rails, rerolling (nominal)	14.50 to 15.00
Low phosphorus heavy melting steel scrap	16.25 to 16.75
Old steel axles	17.00 to 17.50
Old iron axles (nominal)	23.00 to 23.50
Old iron rails (nominal)	16.50 to 17.00
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	15.75 to 16.25
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron (nominal)	7.00 to 7.50
Wrought turnings	10.50 to 11.00
Cast borings	9.50 to 10.00
Machinery cast	13.75 to 14.25
Railroad malleable (nominal)	12.00 to 12.50
Grate bars, railroad	10.50 to 11.00
Stove plate	10.50 to 11.00

Coke.—There is an apparent deadlock in the furnace coke situation. Producers are standing at $2.25, at oven, for furnace coke for second half delivery, while consumers have not been willing to pay over $2. Developments are awaited with interest, having considerable bearing on the pig iron situation. Moderate sales of second half foundry coke are reported at prices ranging from $2.40 to $2.60, at oven. The following range of prices, per net ton, is named for deliveries in buyers' yards in this district:

Connellsville furnace coke	$4.25 to $4.60
Connellsville foundry coke	4.65 to 4.85
Mountain furnace coke	3.85 to 4.20
Mountain foundry coke	4.25 to 4.45

Cleveland

CLEVELAND, OHIO, May 14, 1912.

Iron Ore.—Sales aggregating about 300,000 tons were made during the week to consumers in the Central West. These sales were made at regular prices. Some other business in small lots is pending. Lake shipments were interfered with early in the month by weather conditions and because of frozen stock piles, but ore has been moving more freely the past few days. We quote prices as follows: Old Range Bessemer, $3.75; Mesaba Bessemer, $3.50; Old Range non-Bessemer, $3.05 and Mesaba non-Bessemer, $2.85.

Pig Iron.—There is a good demand for foundry iron in this territory, but one local seller reports a less active general demand than the previous few weeks. Another local concern whose market is more in the West is figuring on more tonnage than for several weeks. During the week this seller has received inquiries for various grades of iron aggregating about 20,000 tons. Two of these inquiries are for 5000-ton lots and one for 3000 tons. In northern Ohio there is one inquiry for 2000 to 3000 tons of No. 2 foundry for third quarter delivery and another inquiry for 1000 to 2000 tons for the last half. There are also several other inquiries for lots of 500 tons and under of foundry iron. Prices are firm. Sales are being made at $13.25, Cleveland and Valley furnaces, for No. 2 foundry. Some producers are trying to get a slight advance over recent prices. The foundry melt is good. Some furnaces report shipments slightly heavier than a month ago. We quote the following prices for prompt shipment and for the last half, delivered Cleveland:

Bessemer	$15.15
Basic	13.50
Northern No. 2 foundry	$13.25 to 13.50
Southern No. 2 foundry	15.35
Gray forge	12.50 to 12.75
Jackson silvery, 8 per cent. silicon	17.30 to 17.55

Coke.—The market is firm but inactive. Furnace coke is quoted at $2.35 per net ton at oven and for spot shipment for the remainder of the year. Buyers and sellers, however, have not yet gotten together on last half prices. Offers of $2 have been made and some sellers are asking $2.50. Connellsville 72 hr. foundry coke for prompt shipment is quoted at $2.60 to $2.75.

Finished Iron and Steel.—The market is in a very satisfactory condition. Specifications which were light for a few weeks, because of the recent heavy influx of orders on old contracts, are again coming out in large volume for all kinds of finished material. Many of the mills are getting further behind on deliveries. Current orders are not numerous, as consumers are mostly under contract, but these show an improvement. Some new contracts for steel bars, plates and structural material for last half delivery were placed during the week by buyers who failed to get under cover when the lower prices were prevailing. These contracts have been taken at the new prices. The market is very firm and quotations are being strictly maintained on steel bars and structural material. Very little shading is reported on plates, concessions being made only by some of the mills making a narrow range of sizes. We quote steel bars at 1.20c, Pittsburgh, and plates and structural material at 1.25c. Little structural material work of any size was placed with local fabricators during the week. Cleveland fabricating shops, however, are generally well filled with work and are specifying heavily on contracts. An Ohio fabricator has taken bridge work that will require 1400 tons of structural material. New demand for sheets is not active, consumers being nearly all under contract. Prices on black sheets have become quite irregular, owing to the fact that some jobbers who have old contracts are shading prices considerably. Mills generally are not meeting these concessions and are quoting black sheets at 1.90c. to 1.95c. for No. 28. Galvanized sheets are apparently firm at 2.90c. to 2.95c. for No. 28. Shafting is in good demand and an advance in price is expected soon. The demand for light rails has improved and mills are getting better prices than have been prevailing recently. There is little activity

in the iron bar market. Prices are unchanged at 1.20c., Cleveland.

Old Material.—The inquiry for heavy steel scrap has improved. Some consumers are feeling the market for prices and dealers look for a better volume of business. Mills are offering $12 for heavy melting steel and one local consumer is reported to have bought considerable tonnage a few days ago at that price. Dealers claim, however, that they cannot buy steel scrap at a price that would permit them to sell it under $12.50 and that not much can be had at that price. There is also some inquiry for borings and turnings. The Lake Shore and Norfolk & Western railroads have lists out on which they will close May 16. Quotations on heavy steel have advanced slightly. Other prices are unchanged. Dealers' prices f.o.b. Cleveland, are as follows:

Per Gross Ton.

Old steel rails, rerolling	$12.75 to $13.00
Old iron rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.00 to 12.25
Old car wheels	13.00 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	12.00 to 12.50
Light bundled sheet scrap	9.50 to 10.00

Per Net Ton.

Iron car axles	$18.50 to $19.00
Cast borings	7.00
Iron and steel turnings and drillings	7.25 to 7.50
Steel axle turnings	7.75 to 8.00
No. 1 busheling	10.00 to 10.25
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.25 to 11.75
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., May 13, 1912.

Pig Iron.—A leading interest is selling iron on the basis of $11 for No. 2 foundry for the remainder of the year. If fourth quarter only is desired, the tendency as well as practice is to ask $11.50. Two pipe interests are reported as having purchased 45,000 tons for third quarter delivery at something under $11.25. A sale of 600 tons of No. 1 soft for May and June delivery was made at $11.75. The Sloss-Sheffield Steel & Iron Company announces that it has sold more than its make this month and that its price is $11.25 for spot and third quarter, with $11.50 for last quarter. The stocks which this company now has on hand amount to 55,000 tons, against an accumulation at one time of 120,000 tons. One large interest sold 1200 tons for last quarter at $11.50. This company's iron, however, is preferred by some users to any other iron in the district. It is well sold up and is not soliciting business, being inclined to wait for an $11.50 basis all round. Altogether it may be called an $11 market from the fact that iron can be secured at that price, but several interests will not sell under $11.25. The business during the week was not large in volume. Several 100-ton lots were sold at $11 to $11.25, and one lot of 1000 tons for second and third quarter deliveries was sold at $11. As a rule sellers and buyers seem to be holding up somewhat to get their bearings for third and fourth quarters. Some charcoal iron is changing hands at $22 and $22.50. Only two charcoal stacks are in operation. The market is strong with the following minimum quotations, per ton of 2240 lb., f.o.b. Birmingham district furnaces:

No. 1 foundry and No. 1 soft	$11.50
No. 2 foundry and No. 2 soft	11.00
No. 3 foundry	10.50
No. 4 foundry	10.00
Gray forge	9.75
Basic	10.50
Charcoal iron	$22.00 to 22.50

Cast Iron Pipe.—The water and gas pipe foundries continue to turn out a large output and to ship it promptly. Shipments and orders are alike heavy, with no specially large inquiries on hand at this time. Notwithstanding the situation the pipe makers are not inclined to name higher prices. The following quotations are considered reliable for the present: 4 to 6-in., $23; 8 to 12-in., $22.50; over 12-in., average $21.50.

Coal and Coke.—The floods in the lower Mississippi River have considerably diminished the coal shipments from the Birmingham district to a large territory. The steam coal demand shows some decline compared with two weeks ago, but the average demand for the season is better than usual. Virginia coke is still out of the Alabama territory on account of ability to fetch better prices elsewhere. Alabama coke sold during the week was for Alabama use and brought $3.50 at oven. Foundry grades continue to command $3.25 to $3.75 per net ton at oven.

Old Material.—The market is steady, with a fair general demand, especially for wrought scrap and cast. There are no large accumulations. Prices are unchanged as follows, f.o.b. dealers' yards, per gross ton:

Wrought iron car axles	$16.00 to $17.00
Old steel axles	14.50 to 15.50
Old iron rails	14.00 to 14.50
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
No. 1 country wrought	10.00 to 10.50
No. 2 country wrought	9.00 to 9.50
No. 1 machinery	8.50 to 9.00
No. 1 steel	9.50 to 10.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.00 to 10.50
Light cast and stove plate	8.00 to 8.50

Boston

BOSTON, MASS., May 14, 1912.

Old Material.—The market is somewhat easier, with a fair tonnage of transactions. While prices cannot be said to have changed as a whole some material, notably turnings and borings, has been offered a little under the quoted figures. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	$10.25 to $10.75
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	13.00 to 13.50
No. 1 wrought and soft steel	10.00 to 10.50
Skeleton (bundled)	8.25 to 8.75
Wrought iron pipe	9.25 to 9.75
Cotton ties	7.75 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	7.25 to 7.75
Cast borings	6.25 to 6.75
Machinery, cast	12.50 to 13.00
Malleable	8.75 to 9.25
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50
Cast iron car wheels	11.75 to 12.00

Cincinnati

CINCINNATI, OHIO, May 15, 1912.—*(By Telegraph.)*

Pig Iron.—The larger melters of foundry irons are feeling the market, but the inquiry from smaller consumers is not so good. From northern Ohio is a request for prices on 3000 tons of different foundry grades for last half shipment. A Michigan melter wants 2500 tons of high silicon iron, and there are several Indiana buyers in the market for various amounts. One disturbing factor is the apparent inability of producers in the Hanging Rock district to maintain the previously named quotation of $13.50, Ironton, for No. 2 foundry, and malleable, and an Indiana manufacturer was able to contract for 1000 tons of malleable, July-December shipment, at $13 at furnace. For the same movement two northern Ohio melters picked up 200 tons each of No. 2 foundry at $13, Ironton. However, the bulk of sales made are about 25c. a ton above this figure. Southern producers are firmer in the intention of adhering to $11, Birmingham, for prompt shipment, and a number of small sales are reported above this price. While $11.50 at furnace is asked by at least two leading producers for fourth quarter shipment, few orders are being booked at that quotation. The local foundry melt has increased slightly the past week, and a further improvement is anticipated before July 1. No interest is taken in steel making irons, as manufacturers in this territory have covered for future requirements. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.75 to $15.00
Southern coke, No. 2 foundry and 2 soft	14.25 to 14.50
Southern coke, No. 3 foundry	14.00
Southern coke, No. 4 foundry	13.75
Southern gray forge	13.75
Ohio silvery, 8 per cent. silicon	16.70 to 17.20
Lake Superior coke No. 1	14.70
Lake Superior coke No. 2	14.45
Lake Superior coke No. 3	14.20
Basic, Northern	14.45
Standard Southern car wheel	25.25 to 25.50
Lake Superior car wheel	19.00

(By Mail)

Coke.—The situation is somewhat mixed. Connellsville producers are holding out for higher prices, and both contract and prompt shipment furnace coke in that district are quoted around $2.35 to $2.50 per net

ton at oven. On the other hand, 48-hr. brands are obtainable in the Pocahontas field at $2 to $2.15 at oven. Wise County brands are bringing 5c. to 10c. a ton above these last named figures. It is reported that the furnaces in the Hanging Rock district are anxious to cover for last half requirements, but are unwilling to contract at present prices. However, if the labor shortage in the coke fields continues, it will simply be a case of paying producers' asking prices or blowing out the furnaces. Foundry coke is stationary, and is quoted all the way from $2.50 to $3 per net ton at oven in all three producing districts. The average contract figure is around $2.65.

Finished Material.—Although specifications on contracts are coming in at a satisfactory rate, new business in this immediate territory is somewhat limited. The outlook is excellent for the summer, especially in the structural material line. Prices are firm, and 1.20c. Pittsburgh is quoted on steel bars, with plates and small shapes bringing 1.25c. Warehouse prices are unchanged at 1.65c. and 1.75c. respectively.

Old Material.—Business is very light, and while prices are unchanged neither buyers nor sellers are showing much interest in the market. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations the selling prices f.o.b. at yards:

Per Gross Ton.

Bundled sheet scrap	$8.75 to	$9.25
Old iron rails	13.00 to	13.50
Relaying rails, 50 lb. and up	20.25 to	21.25
Rerolling steel rails	11.25 to	11.75
Melting steel rails	10.25 to	10.75
Heavy melting steel scrap	10.25 to	10.75
Old car wheels	11.75 to	12.25

Per Net Ton.

No. 1 railroad wrought	$10.25 to	$11.25
Cast borings	6.25 to	6.75
Steel turnings	6.50 to	7.00
No. 1 cast scrap	10.75 to	11.25
Burnt scrap	7.75 to	8.25
Old iron axles	16.25 to	16.75
Locomotive tires (smooth inside)	12.00 to	12.50
Pipes and flues	7.25 to	7.75
Malleable scrap	8.75 to	9.25
Railroad tank and sheet scrap	6.75 to	7.25

St. Louis

St. Louis, Mo., May 13, 1912.

Market conditions generally here are in a healthy state, with prices well held and buying steady and of a type to indicate that purchases are going into immediate consumption. Nothing of a speculative character is apparent. No extremely large business is reported from any quarter, so far as individual orders are concerned. Collections are satisfactory.

Pig Iron.—Sales of pig iron during the week have been for the most part in carload, 100 ton and 200 ton lots, with perhaps 5000 tons as a total. For No. 2 Southern the quotation is very firm at $11, Birmingham, while the number of representatives of furnaces asking $11.25 is increasing. This refers to last half business generally, while specific quarters, third or fourth definitely, command the higher price. For May and June delivery the price has also been marked up. Nothern iron has been advanced and now is quoted here on a basis of $14.50 Chicago. There are very few inquiries in the market, practically all the business being for current needs. Basic, malleable and other irons are not much sought. No. 4 Southern is still hard to get.

Coke.—There has been no particular movement, but there has been an increasing disposition for consumers to seek anticipation of regular shipments. By-product coke is strong at $5.55 delivered St. Louis, but with little moving.

Finished Iron and Steel.—The Arkansas road has increased its rail order mentioned last week by 500 tons. Very little more is expected to materialize before next month, as the fiscal years are too near their close. At the same time the Missouri-Pacific-Iron Mountain system is likely to re-enter the market shortly, because of the Missouri railroad commission's order, to put its Iron Mountain division in better shape at once. This, with enforced construction work in the Dupo yards, indicate about $2,500,000 expenditure. The Frisco is also expected to require more rails soon. The frog and switch companies are taking considerable quantities in the aggregate. Light rails have been in fair request for their off-season. Fastenings continue in excellent demand, with bolts at $2.05 St. Louis and spikes $1.70 St. Louis. Structural material has been in fair demand, considering the heavy tonnage previously taken, and the feature of the week has been the increasing number of requests that shipments be anticipated, showing that the material is being used as fast as received. The Pittsburgh quotation of 1.25c. is firmly held. Plates are in demand with the market stiffening at 1.25c. Pittsburgh as the minimum, deliveries growing still more extended. Bars are in much the same condition as structural, both as to prices and demand for quick shipment. The only signs of slackening seems to be in the wagon making industry, which has been affected materially by the floods in the South, to which territory much of this business goes.

Old Material.—The stiffening of scrap prices continues and a number of quotations are marked again this week. The railroad lists reported last week went at still higher prices than those preceding and the demand is increasing, especially from the rolling mills. Though one of the leading industries declares its requirements filled for the next 90 days, this is not expected to affect the situation, as the East St. Louis plant of the American Steel Foundries has come into operation, with a consequent effect on the demand. East Side plants are now being worked practically to full capacity. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.

Old iron rails	$14.00 to	$14.50
Old steel rails, re-rolling	12.00 to	12.50
Old steel rails, less than 3 ft	11.50 to	12.00
Relaying rails, standard section, subject to inspection	21.50 to	22.00
Old car wheels	12.50 to	13.00
Heavy melting steel scrap	11.50 to	12.00
Frogs, switches and guards cut apart	11.50 to	12.00

Per Net Ton.

Iron fish plates	$12.50 to	$13.00
Iron car axles	17.50 to	18.00
Steel car axles	15.50 to	16.00
No. 1 railroad wrought	11.25 to	11.75
No. 2 railroad wrought	10.75 to	11.25
Railway springs	10.00 to	10.50
Locomotive tires, smooth	12.50 to	13.00
No. 1 dealers' forge	8.50 to	9.00
Mixed borings	6.50 to	7.00
No. 1 busheling	9.25 to	9.75
No. 1 boilers, cut to sheets and rings	8.00 to	8.50
No. 1 cast scrap	10.50 to	11.00
Stove plate and light cast scrap	8.50 to	9.00
Railroad malleable	9.50 to	10.00
Agricultural malleable	8.50 to	9.00
Pipes and flues	8.50 to	9.00
Railroad sheet and tank scrap	8.00 to	8.50
Railroad grate bars	8.50 to	9.00
Machine shop turnings	7.25 to	7.75

Buffalo

Buffalo, N. Y., May 14, 1912.

Pig Iron.—The market is quiet as compared with the activity in buying prevalent two or three weeks ago, although orders for considerable tonnage are still being booked. The aggregate of sales for the week is about 20,000 tons of all grades, including some trade from Canada, and inquiries are up for 10,000 to 15,000 tons, which have not yet been closed. Buying is widely distributed and is by diversified industries; a good proportion for the week, however, is from car and pipe foundries and radiator plants which are apparently very busy. Pipe makers are shipping their product actively, one local cast iron pipe company being recently in the market for 10,000 tons of pipe iron grades. Prices are firmer, the schedule quoted below representing as closely as possible the market for this district. Most furnaces are holding quite stiffly for the maximum. We quote, f.o.b. Buffalo, for current quarter and last half as follows:

No. 1 X foundry	$14.50 to	$14.50
No. 2 X foundry	13.50 to	14.25
No. 2 plain	13.50 to	14.00
No. 3 foundry	13.50 to	13.75
Gray forge	13.25 to	13.75
Malleable	14.00 to	14.25
Basic	14.00 to	14.50
Charcoal	15.75 to	17.00

Finished Iron and Steel.—Specifications on contracts continue to be received in heavy volume in plates, shapes and bars. New business placed with mills and agencies is lighter for the week, however, but warehouse business is brisker. Consumers are realizing that it will be necessary for them to anticipate their requirements for a longer time ahead and order accordingly and not rely upon the mills to carry stock for them to be specified for on demand, as has been the custom for a long period, and agencies expect this sentiment will shortly result in a further buying movement. Prices are held firmly at 1.20c., Pittsburgh base, for bars, and 1.25c. for shapes and plates, with a tendency toward an advance, owing to the present sold up condition of the mills and the continued steady pressure for delivery. The opinion is expressed by some that the further advance will come about July 1. New business now taken is with very few exceptions restricted to third quarter

specification, mills not being inclined to fill up beyond that time with what they consider will be low price business. The demand for tin plates is active and there has been an advance to an absolute minimum of $3.40, Pittsburgh, per base box, with some mills asking $3.50 for business not quite so desirable, with the prospect that the latter figure will become the minimum in the near future. The advance is due to the scarcity of sheet bars and the increased cost of pig tin. There has also been another advance of $2 per ton on chain, making the minimum asking price on ⅜-in. $3.05, Pittsburgh. Spikes are firm at $1.40 per carload and $1.45 for smaller lots. In wire and wire products the demand continues heavy, as is also the case with sheet steel, and prices remain firm at the advance. There is no abatement of activity in fabricated structural lines. The Buffalo Structural Steel Company has received contract for the fabrication and erection of the 250 tons of steel required for the H-O Company's cereal mill and warehouse addition and grain elevator, Buffalo; also contract for steel for the addition to the plant of the Buffalo Gasoline Motor Company, 100 tons, and for a new factory for the H. H. Franklin Automobile Company, Syracuse, 150 tons; also for the 350 tons of steel for the All Saints' church and school, Buffalo, for which the Bison Construction Company holds the general contract. The Jones & Laughlin Steel Company has been awarded contract for 260 tons of steel for the Eastman Kodak Company's factory building No. 46 at Rochester. Bids are soon to be received for the steel for the remodeling of the Washington Market Building, Buffalo, from plans of Howard L. Beck, city architect, for which a considerable tonnage of steel will be required.

Old Material.—Local buying is still very slack in all lines, and only a limited amount of material is being shipped to other markets, dealers preferring to hold their stocks for the improved demand and better prices which they anticipate will soon be in evidence. Prices, which are unchanged from last reported, are being firmly maintained by dealers. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75	to	$13.25
Low phosphorus steel	15.75	to	16.00
No. 1 railroad wrought	13.50	to	13.75
No. 1 railroad and machinery cast scrap	13.50	to	14.00
Old steel axles	16.50	to	17.25
Old iron axles	21.00	to	21.50
Old car wheels	12.50	to	13.00
Railroad malleable	12.50	to	13.00
Boiler plate sheared	13.75	to	14.25
Locomotive grate bars	11.00	to	11.25
Wrought pipe	9.50	to	10.00
Tank iron	10.00	to	10.25
Wrought iron and soft steel turnings	8.00	to	8.50
Clean cast borings	7.00	to	7.50

Semi-Finished Steel Higher

British Pig Iron and Steel Production in 1911

(*By Cable*)

MIDDLESBROUGH, ENGLAND, May 15, 1912.

The market has a very firm tone and there is considerably more speculation in pig iron, which promises to advance further. Production is still below demand and stocks continue to decline. Cleveland pig iron in Connal's stores was 389,094 tons on May 2, or 203,509 tons less than on May 4, 1911. The present rate of reduction is 10,000 to 12,000 tons a week. There is a good demand for semi-finished steel and it is increasingly difficult to buy. The Steel Corporation has sold sheet bars at 105 shillings c.i.f. German and Belgian steel mills are very full and the former have withdrawn entirely from the market for sheet bars. All finished material is strongly held. The general sentiment is sensitive to American news.

British pig iron production in 1911 was 9,718,638 gross tons, as against 10,216,745 tons in 1910. The production of steel was 6,461,612 tons, against 6,010,684 tons in 1910.

We revise quotations as follows:

Cleveland pig iron warrants (closing Tuesday), 54s. ½d., against 53s. 3d. one week previous.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 54s. 9d.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £5 15s. to £5 17s 6d.

German 2-in. billets, f.o.b. Antwerp, 100s.

German basic steel bars, f.o.b. Antwerp, £5 14s. to £5 15s.

Steel bars, export, f.o.b. Clyde, £7 12s. 6d.

Steel joists, 15-in. export, f.o.b. Hull or Grimsby, £6 17s. 6d., or 5s. advance in two weeks.

Steel ship plates, Scotch, delivered local yard, £7 14s. 9d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 5s.

Steel rails, export, f.o.b. works port, £6 5s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 14s. 6d. to 14s. 9d., October-December.

The German Steel Syndicate's Renewal

BERLIN, May 2, 1912.

The most important news of the week in the iron trade is the renewal of the Steel Works Union in the early morning hours of yesterday. The time for the renewal had actually expired, but by continuing the sitting for several hours beyond midnight an agreement was reached, after the prospect of getting all the works to come together had seemed well-nigh hopeless. At the last moment the Stumm Works, of the Saar district, came forward with a demand for an extra quota for a branch steel plant that it proposes to establish in connection with its blast furnaces near Diedenhofen in Lorraine. This demand so intensely disgusted the representatives of some of the older establishments that they gathered up their papers and were about to leave the meeting, but the guiding spirits of the Union finally succeeded in saving the organization.

The prolongation is for a period of five years, beginning with July 1, but the new organization is to be confined to semi-finished materials (blooms, billets, slabs, etc.), steel rails and ties and structural shapes, composing class A products. These constitute the fully syndicated products under the present combination.

Class B Products Not Fully Syndicated

Class B products (bars, plates, sheets, rods, tubing and steel castings and forgings) have never been fully syndicated; in other words, the Union has made allotments in them and exacted a penalty of 20 marks a ton (crude steel weight) on all goods turned out in excess of allotments, but the mills were left to market their product at their own prices. Under the new agreement class B is dropped altogether and free competition in its products will reign where special trade organizations do not already exist, or where they are not formed in future.

At present the most important section, namely, bars, is wholly unorganized, and this is also true of tubing. The wire rod men are organized and so are the heavy plate mills, but several important concerns drew out of the latter about the first of the year. It is said that extra efforts are to be put forth now to effect organizations in the various lines of B products. But as such efforts have hitherto proved ineffectual it is doubtful whether organizations can be made now.

Export Bounties in Different Form

In connection with the reorganization of the Union it was announced that it would drop its system of export drawbacks on material used in products for the foreign market. Later information, however, indicates that a virtual export bounty will continue to exist, but in a different form. The mills will continue to buy at lower price material to be worked up into export goods. It is expected that the Union will soon raise the price of semi-finished material for the third quarter of the year by 5 marks. The Wire Rod Association is preparing, in anticipation of this, to raise its prices by 5 to 7.50 marks, and it is to be expected that the plate mills and other classes of producers will adopt similar advances.

Details of the New Syndicate Agreement

The details of the new organization are as yet only partly known to the public. It is learned that Gelsenkirchen and Thyssens got each 100,000 tons as allotments for their new establishments in the Luxemburg-Lorraine district, and that the Burbach concern got 62,000 tons. A small quota was voted to Stumm for the new steel mill already mentioned. The Krupp Company was also allowed the 162,000 tons of material to be supplied to Mannesmanns (mentioned in last week's report) over and above its allotments in semi-finished materials. Otherwise the older members of the combination received but slight increases in their quotas.

The total allotments in A products, which now amount to 6,259,500 tons, have probably been raised to about 6,700,000 tons, but the exact figures have not been given out. The settlement of the controversy over heavy beams of the dimensions and forms turned out under the Grey patents was made upon the basis of

continuing the monopoly held by the Deutsch-Luxemburg Company, which owns the Grey patents for Germany; but there are certain modifications in favor of several other establishments, the exact nature of which has not yet been made known.

Effect on the German Stock Market

The prolongation has been greeted by the stock market with a strong advance in iron shares, speculators naturally regarding the event as of great significance for the profitable operation of iron companies. The strong tone of the market has also been distinctly assisted by the latest report of *The Iron Age* on the American situation.

Production still goes on at the heavy rate already described and prices are firmly held. The Union finally consented, after eliminating B products altogether from its control, to raise the quotas in them for May and June by 30 per cent.; hence it may be expected that enlarged production in these branches of trade will begin forthwith. The associated dealers in gas pipe in the Rhenish-Westphalian district have just advanced prices by reducing rebates 1 per cent.

Further advances of home and export prices have been reported from Belgium since last week's report and the market advices coming thence to the German press are very optimistic.

New York

NEW YORK, May 15, 1912.

Pig Iron.—The Eastern pig-iron market has been decidedly quiet. Only one considerable inquiry is known to be before the trade. It would appear that consumers in New York State and in New England, as well as in the metropolitan district, are quite well supplied with iron for the next few months, perhaps better than the average of foundries in the Middle West. One steel works furnace in the Lehigh Valley has blown out, and one at Coatesville will probably be blown out in the near future. The basic situation is not very clearly defined. Some iron was sold two or three weeks ago at $15 delivered in eastern Pennsylvania, and a later sale has been made at $15.25 for delivery at Harrisburg. But ideas of buyers and sellers vary somewhat. The latter are generally asking $15.50 delivered. The pig iron stocks of members of the Eastern Pig Iron Association, which have not been over 100,000 tons for a good many months, are probably about two-thirds of that amount at present. Indications are for a continuance of the present quiet market in foundry iron for some time. The coke situation has not cleared up and the basis of contracts for the second half is still a matter of considerable speculation. There is no indication, however, of any immediate increase in foundry iron production in Eastern districts. We quote as follows for Northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.50 to $15.75 for No. 1 foundry and $15 to $15.25 for No. 2 foundry.

Finished Iron and Steel.—There have been no changes in the general situation. A very large volume of business is being done; the seller continues in the strong position he has enjoyed for some weeks, and though there are evidences here and there of price concessions, their effect on the large amount of material placed at the announced schedule of prices is probably such that average prices shade this schedule but slightly. The structural market is strong because of the considerable amount of building work pending, but there is substantially a lull in present settlement just as there continues to be a temporary stoppage in car buying. Buyers of bar iron are showing considerable interest in future delivery business, which may indicate a fear of price advances in this line, but in steel bars no large new business has really come into the market to test the present price. Prices of small lots from store have advanced $1 to $2 a ton. In general, specifications on contracts exceed the minimum requirements and rolling schedules are established probably six or seven weeks in advance. In the structural field considerable interest is now taken in the imminence of an award of the 14,000 tons of steel for the Biltmore Hotel on the Grand Central terminal area and in the 3000 tons for the meter repair shop mentioned in these columns; bids have gone in for a 2500-ton bridge over the Monongahela for the Pennsylvania Railroad, and 1400 tons will be required for the Hamden electric railway system between Chicopee and Springfield. One interesting inquiry for miscellaneous steel bars, amounting in all to probably 400 tons, is noted for the New York Connecting Railroad, including a large number of 1½-in. tie rods about 60-ft. in length. Of the steel car business it is learned that the Seaboard is considering 200 more hopper cars and 25 cabooses; that the Northern Pacific may buy 700 cars; the Wabash & Pittsburgh Terminal 2000 or more and the Chicago, Burlington & Quincy may also shortly come into the market. Business in frogs and switches is reported especially good and the Pennsylvania Steel Company has recently closed for unusually large orders, including work on Long Island. Recent structural awards include 8000 tons for the New York subway, comprehending the section under the Harlem River, to the American Bridge Company; 1100 tons for arch centers for constructing the Lackawanna's monumental reinforced concrete arch bridges to the Fort Pitt Bridge Works; 1700 tons for the requirements of the Western Maryland Railroad, to the Pennsylvania Steel Company; 2000 tons for the Boston & Maine over the Connecticut River, to the American Bridge Company; 600 tons for the extension to the power house of the Philadelphia electric system, to Lewis F. Shoemaker & Co.; 1000 tons for a terminal warehouse on West Twenty-seventh street, to the Levering & Garrigues Company; 1100 tons, apartment house, Seventy-ninth street and Park avenue, New York City, to Passaic Steel Company. A general contract has been placed for a building at Glens Falls for the Glens Falls Insurance Company, involving 800 tons of steel. Quotations are: Steel bars, plain structural material and plates, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material from store, New York, 1.75c. to 1.85c.

Cast Iron Pipe.—While public lettings have latterly diminished in number and importance, the demands of private buyers have not abated, but the volume of business from this class of trade continues excellent. The pipe foundries are quite well supplied with work, and a good year seems to be reasonably assured. Carload lots of 6-in. are still available from some makers at $21, tidewater, per net ton, but others hold their product firmly at $22 to $23.

Old Material.—Although no great buying movement is observed in this vicinity, the volume of general business is somewhat better. Occasional sales of heavy melting steel scrap are made, with some little movement in the classes of old material consumed by rolling mills, while foundries are steadily in the market for small lots of cast scrap. Dealers' quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	$11.25 to $11.50
Heavy melting steel scrap	11.25 to 11.50
Relaying rails	20.00 to 20.50
Rerolling rails (nominal)	12.50 to 13.00
Iron car axles	21.00 to 21.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.25 to 11.50
Light iron	5.25 to 5.75
Cast borings	7.25 to 7.75
Wrought turnings	8.25 to 8.75
Wrought pipe	10.50 to 11.00
Old car wheels	13.50 to 14.00
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	10.00 to 10.50

Metal Market

NEW YORK, May 15, 1912.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
		Electro-	Tin,	New	St.	New	St.
May.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
9	16.00	15.87½	46.15	4.20	4.05	6.75	6.60
10	16.00	15.87½	46.30	4.20	4.05	6.75	6.60
11	16.00	15.87½	.....	4.20	4.05	6.75	6.60
13	16.12½	16.00	46.65	4.20	4.05	6.85	6.70
14	16.25	16.00	46.25	4.20	4.05	6.85	6.70
15	16.25	16.00	46.12½	4.20	4.05	6.86	6.70

There have been advances nearly all along the line, with some metals reaching very high figures, notably copper and tin. The spelter situation is unchanged and steady.

New York

Copper.—The price of copper has advanced, its upward trend aided by the report of the Copper Producers' Association, issued last Wednesday. Lake is now quoted at 16.25c., 30 days' delivery, and figures beyond July are not obtainable, as it is believed that the price will further advance, in some circles 17c. being predicted. The amount sold during the week was fairly large, at prices varying from 16.12½c. to 16.25c. Electrolytic has also been active, and its price has ad-

vanced to 16c. Some large sales are reported at these figures. The consumption both here and abroad is large and the demand is fairly strong. In London today the market opened quiet, with spot copper quoted at £72 and futures at £72 8s. 9d. The exports of copper so far this month are 11,318 tons.

Pig Tin.—Trading was fairly active in the week, and pig tin reached 46.65c., but has receded and is now being offered at 46.12½c. for early delivery, with very little demand at that figure. These prices are said to be too high for speculation, and the dealers are conservative. The London market is quieter. Spot tin was offered at the opening to-day at £210 10s. and futures at £206. The arrivals reported so far this month are 1620 tons, and 1810 tons are reported afloat.

Tin Plates.—In sympathy with pig tin, foreign tin plates have advanced and are now quoted at 14s. 7½d., laid down at Swansea, Wales. The price of domestic 100 lb. coke plates, New York, however, is unchanged at $3.54.

Lead.—Lead is decidedly dull at unchanged prices, and the week has seen an uninteresting market with quotations of 4.20c., New York, and 4.05c., St. Louis. These prices should be attractive enough to bring better business.

Spelter.—Much is said of the scarcity of spelter, and there is apparently little to be had in this market. Business is largely speculative, consumers having little confidence in present prices. The metal is quoted at 6.85c. here and 6.70c. St. Louis, for May and June delivery, quotations beyond that time not being made.

Antimony.—The market is steady, with very little trading at the prices quoted. The recent advance of Cookson's to 8c. is being maintained, while Hallett's is selling at 7.62½c. Hungarian brands are bringing 6.87½c. These prices are for cash and for spot delivery.

Old Metals.—The market is strong at advanced prices. Dealers' selling quotations are as follows:

	Cents per lb.
Copper, heavy and crucible	15.00 to 15.25
Copper, heavy and wide	14.50 to 14.75
Copper, light and bottoms	13.25 to 13.50
Brass heavy	10.00 to 10.25
Brass, light	8.00 to 8.25
Heavy machine composition	12.50 to 12.75
Clean brass turnings	9.25 to 9.50
Composition turnings	11.00 to 11.25
Lead, heavy	4.00
Lead, tea	3.75
Zinc, scrap	5.50

Chicago

MAY 13.—The copper market is decidedly strong, and contracting for July requirements is under way, though quotations are unchanged. Tin prices are slightly higher than a week ago. Dealers' buying prices for old metals are stronger, particularly in the copper and brass grades. We quote as follows: Casting copper, 16c.; Lake, 16.25c., in carloads for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 47.50c.; small lots, 49.50c.; lead, desilverized, 4.15c. to 4.20c., for 50-ton lots; corroding, 4.40c. to 4.45c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.95c. to 7.05c.; Cookson's antimony, 8.50c., and other grades, 8c., in small lots; sheet zinc is $8.65, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 13.75c.; copper bottoms, 12.25c.; copper clips, 13.50c.; red brass, 12c.; yellow brass, 9.75c.; lead pipe, 3.90c.; zinc, 4.75c.; pewter, No. 1, 28c.; tinfoil, 32c.; block tin pipe, 42c.

St. Louis

MAY 13.—The metal markets have shown a very good demand in practically all branches. Lead is quotable today at 4.07½c. to 4.10c., with some holders asking more. Spelter is steady at 6.60c. to 6.70c., according to delivery. Tin has jumped to 47.20c. on the current flurry. In copper Lake is 16.35c. to 16.60c. and electrolytic 16.35c. to 16.47½c. Antimony is unchanged at 8.35c. In the Joplin ore district the past week zinc blende broke all records in the history of the camp, best grade commanding $59 per ton for 60 per cent., with the best lots reaching $61.50, which is $1.50 higher than the famous settlement of 1905. Even at these high prices producers in many instances refused to sell. This is chiefly due to the belief that the Steel Corporation is facing the necessity of supplying high grade spelter from the Joplin district for galvanizing sheets and wire instead of low grade Western ore in order to make good on contracts. Calamine jumped, with blende commanding $29 for 40 per cent. and the choice lots selling for $33. Lead ore was weaker at $52 to $54. On miscellaneous scrap we quote as follows: Light brass, 5c.; heavy brass and light copper, 9c.; heavy copper and copper wire, 10c.; zinc, 3.50c.; lead, 3.50c.; pewter, 21c.; tinfoil, 31c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, May 15, 1912.

The depression in the stock market alluded to last week reached its low point on Wednesday, and a sharp recovery occurred on the following days. The advance made in some stocks was decidedly noteworthy. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	1 - 1⅛	Pressed Steel, pref.	100 -102¼
Allis-Chalm., pref.	4	Railway Spring, com.	35⅛ - 36¾
Bald. Loco., pref.	106¾-107¾	Republic, com.	22⅝ - 24⅛
Beth. Steel, com.	36¾ - 40¾	Republic, pref.	77½ - 80¾
Beth. Steel, pref.	71¾ - 74¾	Sloss, com.	50 - 52½
Can, com.	39 - 43	Sloss, pref.	100
Can, pref.	116¾-121½	Pipe, com.	16¾ - 21
Car & Fdry., com.	57 - 60	Pipe, pref.	54 - 56
Car & Fdry., pref.	118 -118½	U. S. Steel, com.	64⅛ - 71¼
Steel Foundries	37½ - 39½	U. S. Steel, pref.	109¾-111¾
Colorado Fuel	27¾ - 29½	Westinghouse Elec.	74 - 76¾
General Electric	166¾-170¼	Va. I. C. & Coke	61 - 62
Gr. N. Ore Cert.	40 - 42⅞	Am. Ship, pref.	103¾-104
Int. Harv., com.	115⅞-121½	Chic. Pneu. Tool	51 - 51¾
Int. Harv., pref.	117 -120	Cambria Steel	42¼ - 43½
Int. Pump, com.	29½ - 30½	Lake Sup. Corp.	28 - 29¾
Int. Pump, pref.	81½ - 81¾	Pa. Steel, pref.	100
Locomotive, com.	41⅞ - 44	Warwick	10½ - 10¾
Locomotive, pref.	108 -109¾	Crucible Steel, com.	11⅜ - 12½
Nat. En. & St., com.	16¼ - 18	Crucible Steel, pref.	82½ - 84
Nat. En. & St., pref.	92½	Harb. Wk. Ref., com.	39
Pressed Steel, com.	34¼ - 36½	Harb. Wk. Ref., pref.	99

Heavy Orders for Motor Trucks

It is stated that the largest single order for motor trucks ever placed with one organization has just been given to the International Motor Company, manufacturer of Mack, Saurer and Hewitt trucks, Broadway and Fifty-seventh street, New York, by the Star Motor Delivery Company, Chicago. The order is for 50 Mack trucks of various sizes, which are to be put in service in the next few months for handling urban and suburban delivery service of Chicago merchants. The Star Motor Delivery Company is said to be the largest organization yet formed for general public trucking and transportation service in this country. The size of the order is particularly flattering to the motor truck industry in general and to the International Motor Company in particular, as the trucks will be used under perhaps as severe conditions as any motor trucks in service for public transportation work. This order was placed after months of the most searching investigation and rigid tests of practically every American make of motor truck, and the fact that the Mack was finally selected as the machine best adapted for the severity of the conditions is a distinct triumph for the manufacturer of this oldest of American-made trucks.

The International Motor Truck Company has also received an order from the City Fuel Company, Chicago, for 25 Saurer motor trucks, claimed to be the largest single order ever placed by a coal merchant for motor transportation. This comes as a gratifying indorsement of the motor truck by an industry which has been, perhaps, one of the most reluctant to be converted to the advantage of motor transportation, and not without good reason, because comparatively few motor truck manufacturers have built trucks adaptable to the extraordinarily hard service of delivering coal. The first 15 of the Saurer trucks to go into service for the City Fuel Company will displace 70 double teams. It is said that before deciding to motorize its delivery department the company investigated and tested every motor truck of any consequence on the market.

It is obvious from these large orders that the business world has come to accept the motor truck as a tried and proved business investment and no longer an experiment for somebody else to test out. There is now no question as to the practicability, the efficiency or the economy of a motor truck, but it is a problem of putting the right truck in the right place, under the right conditions and operating it so as to obtain the right return upon the investment.

The Canadian Government announces that the South African Government has granted a tariff preference to Canadian wire netting and wire for reinforced concrete.

S. DIESCHER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

Personal

James A. Farrell, president United States Steel Corporation, made an inspection trip last week to plants of the subsidiary interests in the Pittsburgh and other western Pennsylvania districts and in the Mahoning Valley, Ohio. He was accompanied by John Reis, assistant to the president; A. C. Dinkey, president Carnegie Steel Company; E. W. Pargny, president American Sheet & Tin Plate Company, and other officials.

Herbert W. Gwyn, Philadelphia, Pa., who for many years was secretary of the Richard Heckscher & Sons Company, operating the Swede blast furnaces, and more recently connected with the Alan Wood Iron & Steel Company, which took over the former concern about two years ago, has returned from an extended trip in the South, fully recovered in health.

Alfred Still, an English engineer of note and author of a number of standard works, such as "Polyphase Currents," has accepted the position of chief engineer to the mines and hydroelectric power plants of the Algoma Steel Company in the Michipicoten district of Canada, making his headquarters at the Helen mine. He went to Canada a year ago as electrical engineer of the Lake Superior Power Company, Sault Ste. Marie, Canada, which is under the same control as the steel company.

Ralph W. Cooke has been appointed industrial agent for the Pennsylvania Lines west of Pittsburgh. His duties will be to aid in the development of natural resources and industries in the regions reached.

W. J. Norris, who recently resigned from the Wheeling Corrugating Company, has been appointed sales agent for the Parkersburg Iron & Steel Company, with headquarters in Parkersburg, W. Va., and will assume his new duties at once.

F. N. Hoffstot, president Pressed Steel Car Company, arrived in New York May 8 from an extended sojourn in Europe.

Charles M. Schwab, president Bethlehem Steel Company, returned last week from the Pacific coast.

J. C. Maben, president Sloss-Sheffield Steel & Iron Company, will soon sail for Europe.

W. E. Corey sailed for Europe this week.

George Price, formerly with the Tidewater Building Company and later with D. C. Newman Collins and S. Fisher Miller, engineers, has been retained by the Flintkote Mfg. Company and J. A. & W. Bird & Co., of Boston, to represent them in the metropolitan district on their line of building specialties, with offices at 66 Beaver street, New York.

G. H. Jones, vice-president Inland Steel Company, left Chicago May 11 for a brief trip to Europe, expecting to return June 1.

H. O. Swoboda, consulting electrical and mechanical engineer, has opened an office at 406 Embire Building, Pittsburgh, Pa., intending to devote his time largely to the designing of electrical and mechanical apparatus.

Samuel M. Curwen has been elected president of the J. G. Brill Company, Philadelphia, Pa., to succeed the late James Rawle. Edward Brill, the third and only remaining son of J. G. Brill, who with his eldest son, G. M. Brill, founded the company in 1868, was elected vice-president. Mr. Curwen entered the employ of the company as an apprentice in 1879.

W. P. Brown has resigned as contracting engineer of the King Bridge Company, Cleveland, Ohio, to become associated with Wilbur J. Watson & Co., civil and architectural engineers, Citizens' Building, Cleveland.

J. W. Blair, formerly treasurer of the American Cast Iron Pipe Company, Birmingham, Ala., has been placed in charge of the recently opened San Francisco office of the Lynchburg Foundry Company.

The Standard Roller Bearing Company, Philadelphia, Pa., states that, extensive as is its plant, orders have so increased that it was found impossible to keep abreast of them, and it has therefore purchased and installed over $100,000 worth of additional machinery equipment to increase its facilities in this direction.

Obituary

OTTO JAHN, chief engineer of the Vilter Mfg. Company of Milwaukee, Wis., for nearly a quarter of a century, died April 29, after a short illness, aged 59 years. He was born in Luetjenburg, Schleswig-Holstein, where his father was a prominent physician. He studied at the Gymnasium in Kiel and later at the Royal Institute of Technology in Chemnitz, Saxony. After serving in the army in Dresden he graduated from the Polytechnic Institute, Berlin. In 1879 he came to America and entered the employ of the Scranton Locomotive Works, Scranton, Pa. For six years he was superintendent of the plant of the Morden Frog & Crossing Works, Chicago, severing that connection to assume a responsible position in the mining department of the Fraser & Chalmers Company, now the Chicago works of the Allis-Chalmers Company. Two and a half years later he removed to Milwaukee, and in April, 1889, entered the employ of the Vilter Mfg. Company as chief engineer, in charge of construction and design. During his 23 years' continuous connection with the Vilter Company the business developed from an output of a few ice making or refrigerating plants to more than 150 plants per annum, many of them of large capacity. The successful application of refrigeration to many diversified industries is due in a large measure to his extensive experience in this field and a careful study of the problems involved. He leaves a widow and a daughter.

SPENCER NEEMES, of the firm of Neemes Brothers, iron founders, Troy, N. Y., died suddenly May 4 at his home, aged 55 years. He had returned from a business trip and had been in the house but a few minutes. He was born at Whitehaven, England, and was brought to this country by his parents when two years old, the family locating at Albany, where he was educated. For a short time he was interested in the lumber business at Albany, but about 30 years ago he removed to Troy, and with his father, the late George C. S. Neemes, and brother, Joseph Neemes, established the business now carried on under the name of Neemes Brothers. He was of the fourth generation in his family engaged in the iron business. He leaves a widow, one daughter and one son.

GEORGE ALLEN MCDOUGALL, sales agent of the Carnegie Steel Company at St. Paul, Minn., died in that city May 7, aged 66 years. He had represented his company at Minneapolis and St. Paul for 25 years, and since the formation of the Steel Corporation had been Northwestern sales agent for the Illinois Steel Company also. He was born in Wellsboro, Pa., and went to Minneapolis in 1876, having several connections there before entering upon the steel business. He was prominent in the commercial organizations of St. Paul and had lived in that city since 1897. In 1864, when 18, he enlisted in the Third Minnesota Volunteer Infantry. He leaves a widow and three sons.

J. WESLEY PULLMAN died at his home at Wyncotte, Pa., May 5, aged 73 years. He was born in New York, a grandson of Peter Cooper, and was graduated from the College of the City of New York. He was connected with the Cooper Union Industrial School for several years and afterward with Cooper, Hewitt & Co. in the iron business. Later he established an iron-ore business in Philadelphia, which he conducted for many years.

AMORY EDWARDS ROWLAND of the Rowland Machine Company, New Haven, Conn., died May 7, aged 59 years. He was graduated from the Sheffield Scientific School of Yale University in 1873 and became connected with the Rowland Machine Company 35 years ago. He was a member of the Yale Graduate Club, the Delta Psi Fraternity and the Chemical Engineers' Club. He leaves a widow.

G. B. GUNDERSON, secretary and treasurer of the Detroit Stove Works, Detroit, Mich., died at Watkins Glen, N. Y., May 7. He had been ill for several months.

E. W. Beatty, solicitor for the Canadian Pacific Railway, stated before the Dominion Railway Commission last week that the company had ordered 250 new engines and 12,500 cars. It is believed that this is the largest amount of rolling stock ever placed on order at one time in Canada.

The Steel Corporation Dissolution Suit

Testimony Thus Far Refers Largely to Wire Pool Operations and to the Organization of the Moore Consolidations—Effects on Prices

The first week in the taking of testimony in the suit of the United States Government for the dissolution of the United States Steel Corporation was largely given up to matters involving the American Steel & Wire Company. In the five days' sessions, in Room 210 at the Custom House, New York, 12 witnesses were examined. On the fourth day Henry P. Brown of Philadelphia, the examiner, appointed John Arthur Brown, his son, as special examiner, and the latter presided on that day. Judge Brown will be relieved in this way from time to time. It is interesting to note that the functions of the examiner in a case of this sort are in no sense judicial. He swears witnesses and presides over the sessions, but makes no rulings on the admissibility of testimony or any other point. Where the competence of any testimony offered is a matter of question the attorneys on the opposing side simply make their objection; this is entered in the proceedings and goes up to the court to which the evidence is finally submitted.

American Steel & Wire Company Documents

On Wednesday, May 8, Judge Dickinson, attorney for the Government, put on the stand Harry A. Whitney, Worcester, Mass., who had charge of the correspondence of the American Steel & Wire Company in its electrical and wire rope departments. He testified concerning the burning at one of the Worcester plants of a trunk full of papers relating to wire rope agreements and minutes of meetings of the wire rope pool. These papers had all been in the possession of the Government for some weeks in 1911, and evidence was taken from them which was used in the prosecution of various members of wire pools. After these proceedings had been finished the Government turned the papers over to the American Steel & Wire Company and they were sent to Worcester. Considerable time was spent by the Government attorney in bringing out details concerning the burning of these papers, particularly by whose authority this was done and when it was done. The effort of the Government was to show that the papers were destroyed after the beginning of the dissolution suit against the Steel Corporation, but this was not sustained by the testimony given by Frank Baackes, vice-president and general sales manager, and George A. Cragin, assistant general sales manager, of the American Steel & Wire Company, who were put on the stand by the Government. It could not be definitely determined either from their testimony or from that of Mr. Whitney when the papers were burned, whether in October or November, 1911.

The Jackson Wire Pools

William Durham, who is connected with the United States Steel Products Company, was called by the Government to testify concerning the Government's allegation in an injunction proceeding brought at Trenton, N. J., that President James A. Farrell, of the Steel Corporation, had some participation in the so-called Jackson pools in wire products. It is the contention of the Steel Corporation's attorneys that Mr. Farrell, when president of the United States Steel Products Company, had nothing to do with these pools. His company was an agent for the different subsidiaries, it was claimed, and the latter made their own prices, but the export company had nothing to do with the manner in which these prices were arrived at. Mr. Durham was called to identify some correspondence between Mr. Farrell's office and George A. Cragin, referring to reports that were to be filed, showing what products of the wire company were exported. In the operation of the pools export business was excluded from the tonnage allotted to a member. Mr. Durham testified that he never attended any meetings of the pool and that the export company had nothing to do with Jackson or with the operations of the pool.

Karl G. Roebling, general sales agent of the John A. Roebling & Sons Company, testified that his company was a member of several of the Jackson pools, including the Wire Rope Association and the Bare Copper Wire Association. His answers brought out about the same features in these pools that had previously been detailed by witnesses in reference to the horseshoe pool—the fixing of prices by the supervisor, the regulation of allotments, and payments by members who exceeded their apportioned tonnage. After the dissolution of the association in May, 1909, the members met every 30 or 60 days. The object of these meetings, he said, was to promote as much confidence among the membership as possible. Some of those present at the meetings announced the prices at which they were selling. Referring to his own practice, he said that he agreed to give the others notice before making any change in his prices.

George A. Cragin told on Thursday, May 9, concerning pools in the wire trade in which he represented the American Steel & Wire Company. After the dissolution of the pools there were various luncheons at which statements were made by representatives of different companies as to prices which they were asking. There was no obligation upon any attendant to hold to the prices mentioned at these luncheon meetings, and each went out with entire freedom to pursue his own policy. The companies were in active competition and went after all the business they could get. The witness was asked by the Steel Corporation attorneys whether Judge Gary had any knowledge of these pools until about the time they were dissolved, and replied that so far as he knew he did not. The witness had never written or spoken to any director of the United States Steel Corporation about the pools.

In the examination of Frank Baackes, the witness was taken over the ground previously covered relating to the papers which were destroyed at Worcester. Mr. Baackes said that he alone was responsible for the destruction of the papers and that he consulted nobody in the American Steel & Wire Company or in the Steel Corporation. He said he did not think they would be needed again. "I thought it was all over; they had made us a lot of trouble and it was over." The withdrawal of the American Steel & Wire Company from the various pools with which it had been connected was due to the initiative of Judge Gary, the witness said. The general solicitor of the Steel Corporation, who was consulted about the matter at that time, said that the pools were illegal and notice was thereupon given that the American Steel & Wire Company would withdraw. Mr. Baackes said that after the pools broke up there were various luncheon conferences, at which representatives of different companies announced the prices at which they were selling. No pools were formed after the organization of the Steel Corporation so far as he knew, though some might have been reconstructed. He had never advised with Judge Gary or any other officer of the Steel Corporation in regard to membership in any pool. The portion of the American Steel & Wire Company's product affected by pools was about 3 per cent. The remaining 97 per cent. was sold in free and unrestricted competition.

Injunction as to Steel Corporation Papers Largely Denied

While Thursday's hearing was in progress counsel for the Government received a telegram from Trenton, N. J., saying that the injunction asked by the Government, prohibiting the Steel Corporation and all its subsidiaries from destroying any records, had been denied except as to the American Steel & Wire Company. The injunction proceedings were brought February 6, 1912, when the Government attorneys learned that the American Steel & Wire Company papers had been burned at Worcester. The opinion rendered at Trenton by Judges Gray, Buf-

fington and McPherson of the United States Circuit Court contains the following:

The Government asks us to restrain the principal defendant and others, all its subsidiary companies, from destroying books and papers, but without describing them except in very general terms. No evidence is offered that such destruction is threatened, and it need hardly be said that evidence is essential before any man may be either accused or convicted of what would be in substance a criminal interference with the course of justice.

The motion is supported almost wholly by the fact that after certain prosecutions in the southern district of New York came to an end a number of papers belonging to the American Steel & Wire Company that had been furnished by the company to the Government for use in such prosecutions and had been returned to its possession, were destroyed by one of its officers. While we are satisfied that this destruction was without evil intent, the fact remains that the destruction did take place, and we see no reason why (so far as the Steel & Wire Company is concerned) the present order should not be continued.

But it is not known that the other defendants were in any respect connected with this act, and (so far as they are concerned) without evidence we cannot grant the present petition. It must be refused, except as to the Steel & Wire Company, but the government has leave to make a similar motion, at any time in the future if counsel shall regard such a step as necessary or desirable.

Price Fluctuations and Consolidations

At Friday morning's session four of the charts of *The Iron Age*, showing fluctuations in prices of iron and steel products and of metals in the period 1893 to 1911, inclusive, were introduced by the Government's attorneys. A. I. Findley, representing *The Iron Age*, was called to the stand to identify these charts, also to explain the method of their preparation and the market reporting machinery of *The Iron Age* for gathering the prices on which the charts are based. It was brought out that the market quotations of *The Iron Age* are accepted as authoritative by buyers and sellers, that contracts are based on them and that settlements are made on its monthly average prices. The questions of counsel directed attention to the fluctuations in the price curves, particular emphasis being put upon the low prices of 1898 in wire and other products, the high prices of 1899, when consolidations were being formed, and the fact that in the period following that remarkable boom year prices never went as low as in 1898. The attorneys for the Steel Corporation made use of the same charts and of questions emphasizing the depressed conditions of general business in 1898, to show that the advance in 1899 was due to a boom affecting all industries. They also referred in particular to the prices of a number of products in 1901, when the Steel Corporation was formed and the prices of the same products in October, 1911, when the Government's dissolution suit was filed, with a view to showing that the latter prices in each case were lower than the former. The Government counsel called attention to the uniform price of $28 a ton for Bessemer steel rails, which was indicated by a straight line across the price chart, beginning with May, 1901.

Thomas H. Taylor, New York, assistant general sales manager of the American Steel & Wire Company, testified concerning the competition existing between producers of wire in the eighteen-nineties. He gave the names of competitors of the American Steel & Wire Company of Illinois, which preceded the New Jersey corporation. Most of these, he said, including the Washburn & Moen Mfg. Company, the Worcester Wire Company, the Cleveland Rolling Mill Company and the Oliver Wire Company, were absorbed by the American Steel & Wire Company of New Jersey.

Frank J. Newbury, of the John A. Roebling's Sons Company, was questioned by Judge Dickinson concerning the organization of various pools in the wire industry which were conducted by Attorney Jackson, and also concerning the meetings at luncheon held after the dissolution of the pool. He confirmed previous testimony as to the withdrawal of the American Steel & Wire Company from the Jackson pools, and when asked how long these lasted after this company's withdrawal, replied, "About a minute."

The American Tin Plate Company

The second week of the examination of witnesses on behalf of the Government, opened with the calling of Daniel G. Reid, a director of the Steel Corporation, who was one of the organizers of the American Tin Plate Company and its president until it was taken over by the United States Steel Corporation. His testimony marked the transference of the Government inquiry from American Steel & Wire Company affairs to those connected with the so-called Moore group of consolidations, which consisted of the American Tin Plate Company, the American Sheet Steel Company, the American Steel Hoop Company and the National Steel Company. Mr. Reid said that in forming the American Tin Plate Company there was no intention of monopolizing the tin plate industry and that no monopoly exists at the present time, since the tin plate subsidiary of the Steel Corporation produces only about 53 per cent. of the country's output. Mr. Reid recalled that the American Tin Plate Company included about 200 mills owned by 39 companies. He did not remember the aggregate cash value of the plants. Judge Dickinson tried to show that the companies selling out at that time were paid in common stock and the same amount of preferred stock of the American Tin Plate Company—a total of $18,000,000 of each. There was $10,000,000 additional common stock, and the witness was asked to what that was applied. He could not remember except that he got a portion of it for his services as a member of the organizing and underwriting syndicate. To the question, whether in exchange for his stock in the American Tin Plate Company he received in Steel Corporation stock 125 of preferred for 100 of preferred, and 100 of preferred and 20 of common for 100 of common, he replied that the arrangement was something like that. Asked as to his holdings in the United States Steel Corporation, he declined to answer. His attention was called to the contracts for tin plate mill machinery entered into by the American Tin Plate Company with various manufacturers, who were reputedly bound to supply their entire output to the American Tin Plate Company. He replied that he was not able to testify on this matter but that W. T. Graham, of the American Can Company, might know about it. Judge Dickinson called the witness's attention to *The Iron Age* price charts showing advances in tin plate in 1898 and 1899 after the formation of the American Tin Plate Company. It was developed on cross-examination that the company bought its steel in the market and that the price of steel advanced materially in 1899. Tin was very low also in 1898, and the advance in 1899 amounted to about 47 cents on a box of 100 lb. Mr. Severance, of counsel for the Steel Corporation, brought out from Mr. Reid the fact that the National Steel Company was organized to furnish material for the manufacture of tin plate; that the American Tin Plate Company was one of the customers of the National Steel Company and that the American Sheet Steel Company and the American Steel Hoop Company were organized to furnish other customers for the steel company. There was no purpose of monopolizing the manufacture of any product. The promoters thought they might get better prices for their products and might lower the cost of production.

Black Plates for Dipping Plants

Jacob Meurer, Brooklyn, N. Y., a manufacturer and jobber of roofing tin plates, who has been in that business since 1892, told how he was unable to buy black plates from any subsidiary of the American Tin Plate Company in 1899, when his contract with the Whitaker Iron Company, of Wheeling, W. Va., expired. For a period of more than two years after the American Tin Plate Company was formed no independent black plate companies were organized. He said he could not buy any after the tin plate combination was effected, and finally had to import sufficient to continue the manufacture of his company's special brand of roofing material under a tariff of $15 to $20 a ton. The dipping companies held a meeting in July or August, 1899, to see what could be done and talked of starting a mill of their own. He mentioned Follansbee Brothers as one of the companies that afterward built a rolling mill of its own. But this company did not sell black plate in the market.

"Well, did any of those who erected mills ever sell any of their products to the other independents after they began their operations?" asked Attorney Lindabury on cross-examination.

"No," replied the witness, "they used their black plate to make tin plate themselves, the same as the other mills had done."

"So it's a pretty selfish world after all, isn't it?" commented the attorney in conclusion.

The Joint Machinery Jobbers' Meeting

The National Supply and Machinery Dealers, Southern Supply and Machinery Dealers and American Supply and Machinery Manufacturers Associations in Norfolk This Week

The joint triple convention of the National Supply and Machinery Dealers' Association, the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association opened in Norfolk, Va., on the morning of May 13, to extend over three days. The three organizations held their individual sessions in Monticello Hotel, with plans for holding one joint session of the three bodies in the Granby Theatre, on the morning of May 14. The hotels of Norfolk were taxed to their capacity to provide accommodations for the large number of the members of the machinery and supply trades in attendance.

American Supply and Machinery Manufacturers

Willard Parker, president of the American Supply and Machinery Manufacturers' Association, called the first session of his organization to order, and in the course of a short address explained the program which had been arranged, pointing out that the addresses on the program were to be on broad questions of importance to all business men, yet not of a technical or trade character. He expressed the opinion that it is about time the manufacturers of the country gave more attention to the questions of banking and finance. The business before the opening session was then taken up and disposed of with dispatch.

The report of the auditing committee was made by J. W. Macomb, of the New York Belting & Packing Company, Ltd., New York. It showed the finances to be in a healthy condition. The report of Secretary-treasurer F. D. Mitchell showed a gain in membership and that the work of the association had been carried forward in a satisfactory manner. Reports were also received and approved as follows:

Executive committee, submitted by Chairman W. H. Fisher, T. B. Wood's Sons Company, Chambersburg, Pa.; membership committee, read by Mr. Mitchell in the absence of Chairman George W. Taite; the entertainment committee, by Chairman Charles P. King, American Iron & Steel Mfg. Company, Atlanta, Ga.; credentials committee, by Chairman J. E. Osgood, J. M. Carpenter Tap & Die Company, Pawtucket, R. I.; hotel committee, by Chairman Robert B. Nixon, E. C. Atkins & Co., Norfolk, Va.; who's here committee, by Chairman C. B. Jenkins, General Asbestos & Rubber Company, Charleston, S. C. For the labor legislation committee, John R. Broderick, Broderick & Bascom Rope Company, St. Louis, Mo., told of the investigations which had been made into the status of the subject entrusted to the committee.

President Parker announced the appointment of the following committees: Resolutions (all vice-presidents): N. A. Gladding, E. C. Atkins & Co., Inc., Indianapolis; D. K. Swartwout, Ohio Blower Company, Cleveland, and C. H. Jenkins, of the Moran Flexible Steam Joint Company, Louisville, Ky. Nominations (all ex-presidents): Edward C. Hinman, American Steam Pump Company, Battle Creek, Mich.; Samuel L. Moyer, Lunkenheimer Company, Cincinnati, Ohio; Melville W. Mix, Dodge Mfg. Company, Mishawaka, Ind.; John Trix, American Injector Company, Detroit, and S. P. Browning, Ohio Valley Pulley Works, Inc., Maysville, Ky.

Prior to adjournment John Trix made an address in which he emphasized the remarks of President Parker on the importance of conserving human life and limb from the viewpoint of preventing human assets from becoming liabilities.

The afternoon session was devoted to an address on workingmen's compensation by F. C. Schwedtman, St. Louis, and on motion study, by Charles S. Miller, Miller Franklin & Co., New York. Mr. Schwedtman's paper, illustrated by lantern slides, was an elucidation of the subject along the lines laid down in the work, "Accident Prevention and Relief," by Ferd. C. Schwedtman and James A. Emery.

National Supply and Machinery Dealers

The convention of the National Supply and Machinery Dealers' Association was attended principally by those of the organization dealing in supplies and of whom there were eighty present. It was called to order by President W. L. Rodgers, Pittsburgh Gage & Supply Company, Pittsburgh, on the morning of May 13. Mr. Rodgers' opening address contained statistics which he had compiled concerning the scope and financial importance of the members of the association, and it excited keen interest. In part he said:

A HIGHLY CAPITALIZED ORGANIZATION

Just through curiosity I recently took a partially complete list of our members and had their low and highest commercial ratings listed, with the astounding totals of $26,148,500 as the lowest capital rating and $34,110,500 as the highest figure. This list of membership was not complete, as it did not include ratings on several very large houses which have joined our association in the last six months. If you were a partner in a mercantile or manufacturing concern with a capital of $26,000,000 to $34,000,000 and turning your capital over, say four times a year, your business would show the tremendous total yearly sales of $104,000,000 to $136,000,000.

As members of the National Supply and Machinery Dealers' Association we are partners in this highly capitalized organization and each one of us is doing his share of this total of $104,000,000 to $136,000,000. The supply and machinery business of this country is an enormous industry and I am very proud indeed to have had the privilege of serving this splendid and enthusiastic organization in an official capacity during the past week.

RESALE PRICES ON UNPATENTED ARTICLES

The educational work done by this association in connection with the cost of doing business has been one of no little importance. We cannot fail to believe that there has been less foolish price cutting and competition during the past few years than there was before, and we can but feel that some credit for this is due to the work of this association in going so thoroughly into the matter of overhead expense.

Unfortunately, in regard to resale prices, the laws seem to prevent manufacturers of unpatented goods from requiring the absolute maintenance of their selling prices. It has been with a deep feeling of regret that your officers have recognized that the manufacturers are not in a position to demand and enforce the maintenance of prices on unpatented goods.

Some may say that it should not be necessary for manufacturers to act as wet-nurses to the jobber and that the jobbers should have sense enough to get a profit for themselves without any force being employed by the manufacturers. Our contention is that 90 per cent. of the jobbers are willing and able to get a profit, but that the competition of the other 10 per cent. is such that the good intentions of the majority are interfered with to such an extent that it is often necessary for them to meet prices which they otherwise would not make.

Our secretary has advised us recently of two laws pending in Congress which, among other things, take from the manufacturers the right to dictate the prices on patented articles. You have been asked to make protest against the enactment of such legislation. I hope you have done so and that you will endeavor to curb this tendency toward legislation of a character harmful to the business public and to the general public.

MANUFACTURERS' COMPETITION

During the past year our secretary has called your attention to a large number of cases of direct competition of the manufacturers. It is, of course, conceded that as mill supply dealers with a general average on the cost of doing business much the same, we can compete with one another, but there are few, I am sure, who would dare claim that the mill supply dealers could compete with the manufacturer for business for the good reason that the manufacturer has the advantage of him in the matter of his cost. May I, therefore, express the hope that you will continue to advise our secretary's office of all cases where you do find manufacturers in direct competition with you at a price which does not admit of a profit? The secretary

will make the usual request that such a manufacturer extend a price to the trade that they will be able to meet his prices to the consumers and still have a profit after defraying the selling expenses.

PARCELS POST

As you have been advised during the year, efforts have been made by your officers to secure the postponement—if not the defeat—of the pending parcels post legislation. The administration seems to be ardently in favor of parcels post and Congress seems also to be favorably inclined. The public has an idea that parcels post is going to be a means of escape from the unfair treatment of the express companies. All the popular magazines favor the establishment of a parcels post because it would increase the value of their advertising columns and the revenue therefrom by affording an easy means of delivery of goods by the advertisers. Let us hope that the day for the establishment of a parcels post may be still further postponed.

GENERAL ASSOCIATION MATTERS

The monthly letters which have been issued from the secretary's office on business conditions have been of interest to our members, and while any attempt at foretelling the future is surrounded with difficulties, the reports, I feel sure you will admit, have been an accurate diagnosis of conditions and have contained some commonsense expressions on the situation as it has existed. These reports have been prepared by a prominent New York business man who is in close touch with the large business interests throughout the country.

As you will learn from our secretary-treasurer's report, we have had the pleasure of welcoming 16 new members into the association since our last convention. To these gentlemen we extend the heartiest good wishes and the hope that they may reap the greatest benefits from the organization.

You will also learn from the secretary-treasurer's financial report, to be submitted at a later date, that we are in good financial condition and in excellent shape to pursue the work of the association aggressively.

MACHINERY DEALERS

Henry Prentiss, our first vice-president in charge of machinery interests, has been acting as president of the association in so far as machine tool matters are concerned since the last annual convention. Mr. Prentiss enjoys the confidence and respect of the machine tool dealers and builders throughout the country and was active in arranging for the first separate meeting of the machine tool dealers under the auspices of this association. This meeting was held in the Hotel Astor, New York City, October 10 and 11, 1911, at the same time as the meeting of the National Machine Tool Builders' Association, which extended to us the invitation to meet with them at that time. The machine tool builders expressed themselves as highly pleased with the meeting of the dealers and have suggested that the meeting be made an annual event.

The report of Secretary-treasurer Thomas A. Fernley, Philadelphia, showed the affairs of the association, financial and otherwise, to be in a satisfactory condition, and he was complimented upon the showing.

Then followed a symposium on "Business Conditions," in which about fifteen members from various sections of the country, among them Marshall Prentiss, of New York, expressed their views. The general tone was optimistic. It was admitted generally that February and March of this year had been disappointing in the amount of business done, although a betterment had followed March and the present trend is good. The supply trade, it was estimated by some, was doing about 85 per cent. of the business which full activity would entail.

The afternoon session of May 13 was devoted to a discussion of the "Cost of Handling Small Orders in Broken Package Lots and Remedies Proposed," one member having reported 50 per cent. more orders in number in five years to equal volume of five years back; and of "Resale Prices and Their Present Status."

Great interest was aroused by a paper entitled "The Modern Machinery Supply Jobber a Necessary Adjunct to the Manufacturer," by W. T. Dodd, secretary of the Somers, Fitter & Todd Company, Pittsburgh, Pa. This paper is published elsewhere in this issue.

Southern Supply and Machinery Dealers

The Southern Supply and Machinery Dealers in their morning and afternoon sessions, aside from routine business, considered several questions of importance, including "Retroactive Guarantees"; "Discount Sheets and Special Price Circular Letter Quotations"; "Yearly Contracts with Consumers," by M. B. Barkley, first vice-president Cameron & Barkley Company, Charleston, S. C.; "Right of Dealer to Ship Out of His Restricted Territory on Order of Purchasing Agent Located in His Agreed Territory Limits."

The convention was called to order by S. M. Price, president S. M. Price Machinery Company, Norfolk, Va. In a lengthy report the secretary of the association, Alvin M. Smith, Smith-Courtney Company, Richmond, Va., touched on most of the matters in which the organization is especially interested. Of the proposed parcels post he said:

PARCELS POST

"It will help the express companies, who will revise their short-haul rates to meet the Government's competition, leaving the long, unprofitable hauls to the Government. A still greater deficit in postal revenues will result from parcels post, which burden the business interests must sustain, for the magazine owners seem fully able by some means to prevent any advance in postal rates being made to them."

He recounted the progress which has been made toward one-cent letter postage. Of the relations between manufacturers and jobbers he said:

RELATIONS BETWEEN MANUFACTURERS AND JOBBERS

Our relations with the manufacturers are in the main most cordial. More light on this subject will naturally be given you by your manufacturers and conference committee. There is one thing I would like to say on this subject, however, and that is that in conferring with the manufacturers regarding many matters they claim that many benefits we seek from them are not appreciated and are thrown away by us after receiving them, and that we are lacking in confidence in each other. This is a hard accusation and one we should repudiate by our actions toward each other, being fair and in line with the best business ethics.

Some manufacturers who are asked for protection claim that many jobbers are not keeping up their stocks and are asking the manufacturers to carry stocks for them. Direct shipments should not be a part of the jobbers' business except in emergencies and on such heavy goods as the manufacturer does not expect us to carry, and we weaken our position and become merely brokers when we expect manufacturers to carry stock for us and protect us. Let us keep up our stocks and ship from them and thereby earn our right to be called jobbers and demand our right to be protected.

CHANGES IN LIST PRICES

Changes in list prices are being made so frequently by manufacturers that a jobber no longer dares to issue an expensive catalogue. Some method of correcting prices should be worked out which will not make a jobbers' catalogue worthless in many price lists before he has gotten it out to his customers, which is the case now.

RELATIONS WITH OTHER ASSOCIATIONS

In the course of his report on "Relations with Other Associations," Mr. Smith touched on an effort to bring about an amalgamation of some of the associations. He said:

Our relations with other associations are in a most satisfactory condition. Working in harmony with the National Supply and Machinery Dealers' Association, the American Supply and Machinery Manufacturers' Association, Southern Hardware Jobbers' Association and the National Association of Jobbers of Wrought Pipe and Fittings, we have accomplished results of a far-reaching nature on matters which could not have been obtained so quickly by one association acting alone. We must not lose sight of the fact, however, that our identity must not be lost sight of, and the efforts heretofore made by some to persuade members of our association to join them, claiming that benefits which we could not get would be obtained by them, must be frowned upon, for conditions in other territories are entirely different from those in ours, and what the Northern dealers in our line want is in nearly every case opposed to our wants. We can secure much better results for members by continuing as we have in the past, and while I have heard during the past year that more than one of our Northern friends has suggested the merging of our association with others, I cannot but feel that such a course would be very damaging to the Southern dealers' interests and would result in worse conditions for us. Let us remain separate and independent and insist on our friends keeping hands off in the South and Southwest.

Mr. Smith had the following to say of suggestions to eliminate the jobber in supplies and machinery:

JOBBING OF MILL SUPPLIES NOT PASSING AWAY

Fear has been expressed by croakers that the jobber of mill supplies and machinery is passing away and the manufacturer will soon be able to get along without him. There may be some manufacturers who think they can get along without the aid of the large stocks carried by us and the thousands of salesmen whom we employ in their interests, but they are certainly in the minority. We are more a part of the manufacturers' sales organization than ever before and our position as such grows stronger each year and will continue so as long as we continue the co-operative work we have been doing the past six years. If there is any weakness it is due to our own lack of co-operation toward carrying out the sales policy of the manufacturers. We have been frequently accused (and sometimes rightly so) of asking the manufacturers for protection and better profits and then some of us going out and giving them away at the expense of the jobbers who play fair. I believe that fortunately such jobbers are fast dying out, and by continuing the educational work through our association we can soon reach the point where a jobber who does not play fair will be looked upon with disfavor by the reputable manufacturers who do not want their goods, reputation or quality damaged by such commercial pirates and will withdraw their support from them. None of us are in the business except to make a living, and those of us who are constantly trying to do so should not be handicapped by those not competent to run a business on profitable lines.

A New Record for Melting Furnaces

Several statements have appeared in *The Iron Age* in the past few years showing the increased life of furnaces used for melting crucible steel under the careful supervision which is now being given to this class of work. On June 2, 1910, a record was given of a furnace which had been in operation for 1 year, 7 months and 20 days, during which time it produced 2561 heats. High as this record was, it has been very greatly exceeded by a 24-pot crucible furnace in operation at Monaca, Pa., in the works of the Colonial Steel Company. This furnace was in continuous operation from January 10, 1910, until March 20, 1912, a period of 26 months and 10 days, during all of which time the gas was on and the fire kept in the furnace. Steel was melted every day, with the exception of Sundays, 52 Saturdays, and eight days in the month of July, 1911, making in this period 3513 heats. The total weight of steel melted was 9,274,320 lb., of which 924,000 lb. was high-speed steel, the remainder consisting of carbon tool steel and special alloy steels, such as chrome nickel, chrome tungsten and 30 per cent. nickel steel. This record has been made, not only because of the way the furnace was built and because of the material used, although both of these are important, but also because of the care used by the furnace crew, every member of which was interested in the length of the run, as shown by a total cost for repairs of $20.08.

First Shipment of Electric Pig Iron from California

A San Francisco dispatch of May 10 refers to the shipment of the first carload of pig iron ever sent out of California. It was produced at the electric smelting plant of the Noble Electric Steel Company at Heroult-on-the-Pitt, Shasta County, which consists of two Heroult furnaces, built in 1907 and 1911, respectively. The shipment was of a carload lot, consigned to Salt Lake City, and it left Shasta County on May 10. The ore was mined on the Pitt River, close to the smelting plant.

The Reading Hardware Company, Reading, Pa., whose plant had been idle for 12 weeks owing to labor difficulties, resumed operations May 6, having adjusted the differences with its employees. During the idleness some improvements to the equipment have been made. As sufficient raw and semi-finished materials to put the entire plant in operation are not available, the number of men who returned on the date mentioned do not represent its total employees. Within a week or two, however, it is expected that all departments will be operating at full capacity. With its increased mechanical facilities the company will be able to take care of its trade in an expeditious manner.

The Machinery and Supply Jobber*

The Modern Machinery and Supply Jobber a Necessary Adjunct to the Manufacturer

BY W. T. TODD†

In these last few years much has been said and written about the passing of the jobber or middle man in the distribution of the manufacturer's products. While there may be some cause for alarm for their future existence in some lines, we feel that the modern machinery and supply jobbers, with their organization of practical and experienced men, backed up by their "ability to serve" on a moment's notice, are each year becoming more firmly entrenched as a necessity to manufacturers, and in most cases are looked upon as a part of their selling force.

The Modern Machinery and Supply Jobber

Fifteen or 20 years ago the machinery and supply jobbers, as we now know them, were unknown. While it is true that there were so-called supply houses at that time, their lines were very limited compared with the modern store of today. Twenty years ago, the young man with a limited experience of manufacturers' supplies could start in this business with a nominal capital, and by strict attention to business could, with some degree of confidence, look for success. But conditions have materially changed, as this is the era of "big business," and today the modern supply company represents a capital of from $250,000 to $1,000,000, and must be backed up by an organization of practical and experienced men covering a multitude of various lines. While each of its employees is a specialist in certain lines, to be successful all must have a general knowledge of everything carried in stock, and be able to lay their hand on catalogues and talk intelligently on a thousand articles which are not carried in stock but are sold from time to time as the requirements appear.

Years ago, the mine owner or manufacturer, if in want of belting, packing or hose, presented his wants to a belting store or company; for nails or hardware he went to a hardware store; for shafting, pulleys or transmission equipment, he was compelled to go to the manufacturer, which was also the case when his requirements called for steel bars, bar iron and a number of other commodities too numerous to mention, and only thought of the supply company when he wanted a small quantity of pipe, valves, fittings or other ordinary requirements.

The Wide Range of the Supply Jobber

But today the modern supply company is in position to sell manufacturers or mine owners the drawing instruments to prepare their plans and follow this up by supplying contractors with the necessary tools and equipment (which constitutes a line in itself) to excavate for foundation and erect their building; supply the boiler and engine and install a complete power plant, consisting of pumps, piping, valves, fittings, steam traps, separators, and other articles pertaining to it; install the heating plant, if such is desired; and, further, supply the necessary tools required for the business, such as lathes, planers, shapers, punches, shears or whatever equipment of tools is required for the particular line; also the necessary shafting, hangers, pulleys, clutches, etc.; send a practical man to the plant and measure up and place the belting on the pulleys. Or, if electrically equipped, furnish the motors and other electrical appliances necessary, and connect them up in a practical and economical manner when the plant is ready to start. The same house is ready to furnish the manufacturer his small tools, such as drills, files, chucks, reamers, wrenches, and a thousand and one articles that he requires from day to day. This is only one line of the modern supply jobber. The mine owner or superintendent is in position to have his wants supplied in the same manner, and the up-to-date supply jobber is in position, with his practical and experienced organization, to render the same service in any other line.

The modern machinery and supply jobber is looked upon as a necessary adjunct to any manufacturing center, his necessity under such circumstances being as important in

*Read at the Supply Men's Convention, Norfolk, Va., May 13.
†Secretary Somers, Fitler & Todd Company, Pittsburgh, Pa.

order to have the manufacturers' daily wants supplied, as a grocery store is to a largely populated district.

How a Manufacturer Is Helped by the Jobber

The manufacturer with an article to dispose of naturally looks around first to the various supply jobbers in the manufacturing centers as his outlet, and when he is connected with 50 to 100 of them situated throughout the country, placing a stock of his merchandise with each of them and following this up with the necessary missionary work, in the way of a number of men specializing in this particular line, backed up with a proper amount of advertising, he is bound to get results, if the article has merit.

Each of these 50 or 100 houses will have an average of 10 salesmen, or a total of 500 to 1000 men, all going among the trade and exploiting the merit of his goods and creating a demand for them. This force is backed up by the house itself and all the various employees therein, which will run into the thousands.

Pittsburgh, where our company is located, is, without question, the greatest manufacturing center in the country (I might say the world). Therefore, the modern supply jobber is an absolute necessity to its future welfare. We have, in the Pittsburgh district, about 15 supply jobbers with an aggregate capital of about $12,000,000, doing a combined business of from $15,000,000 to $20,000,000, and having from 1500 to 2000 employees, as the business demands. How could the manufacturer expect to place his goods on the market direct as well as through this trained and experienced force?

Manufacturers' Prices

In some instances, when the manufacturers have adopted a selling price to the consuming trade, which permits a legitimate profit to the jobber, some of them have seen fit to undersell this price, which we will all admit is wrong; but, thanks to the educational work of our association, led by the able thoughts of our officers, this evil is being gradually eliminated and hearty co-operation with the manufacturer is taking its place.

The modern supply jobber today handles a more intricate and varied line than our large department stores, and requires a more educated, experienced and technical line of help, who can only be familiar with the line through long years of service in various capacities.

When the customer enters the large department store, he is met by an employee who directs him to the location of the article he wants, where he will find a clerk to wait on him, who may be more or less posted on the goods in his department, but who knows little of any of the other goods in the various departments; and if the customer's wants are varied, he may be transferred to a dozen departments and as many clerks. But the customer entering an up-to-date supply house comes in contact with a man who is able to converse with him intelligently about his wants, and take his order for his requirements, be they mill, mine, manufacturers', railroad or contractors' articles, from an engine, boiler or pump, to the smallest or most intricate article in the establishment. This man, in turn, is backed up by a practical force, who are able to assemble the order, be it ever so varied, and get it in shape for delivery or shipment; which would not be the case in the large department store.

The manufacturer who markets his goods through the supply jobber should be assured that his goods would be carried in stock in sufficient quantity to meet all ordinary requirements, and that the selling force were familiar with the particular merits of his product. In return, the jobber should receive the hearty co-operation of the manufacturer, in the way of a certain amount of missionary work in the territory and advertising, creating a demand for his goods, and refer all inquiries from the territory to the jobber handling his goods; and in no instance solicit or accept orders direct, without consulting his jobbing friends.

No Interest Too Big for a Jobber to Handle

Unfortunately, some manufacturers are under the impression that certain large interests are too big for the jobber to handle; but such is not the case, and the manufacturer will soon realize this, if he will, in the proper manner, back up his representative.

Large interests may, at certain times, be in the market for a large quantity of a certain commodity for their immediate needs, but it is seldom that these same interests will invest their money in any of the article, beyond their immediate requirements; while the jobbers anticipate their customers' requirements, place his orders, invest his capital and stock his goods for the future business, therefore, their "ability to serve."

In my 32 years' experience in the business, it is my judgment that the commodity of the manufacturer who markets his goods only through the legitimate jobber stands in better repute, and his goods are more thought of and are called for oftener than the "weak-kneed" manufacturer who "put one over," as the saying is, by occassionally taking an order direct; for it is always sure to be found out, and seriously impairs the confidence of the jobber handling his line. Manufacturers working hand in hand with the jobber aim more and more to impress the man who can sign the order.

The jobber willing to invest his capital in order to supply the future needs of the trade, and take the risk of fire, deterioration or decline in price, is certainly more to be considered than the party who simply wants to purchase for his immediate needs, no matter how desirable or attractive the order may be. But I am pleased to say that the manufacturers pursuing this policy are largely in the minority, and where we find one giving us this treatment we endeavor to secure some other manufacturer of a similar line who is loyal to the jobber as our base of supply.

Merchant Pipe Makers Protect the Jobber

A few years ago it was no uncommon occurrence for the jobber to find his sharpest competition for business in the line of merchant pipe to be the manufacturer himself; but, I am pleased to say (with thanks to the leading interests and owing to the work of our association in this line, whose efforts were largely instrumental in bringing about the result) that this is not the case today, as, with but very few exceptions, the manufacturers protect the legitimate jobber who carries their line and publish a price to the general trade which enables the jobber to secure the business at the same figures and enjoy a profit.

We have represented with us at this joint meeting of the Southern and the National Supply and Machinery Dealers' associations, and closely allied with us, the members of the National Pipe and Supply Association, whose lines overlap with some of the houses here represented—a total of 1000 business houses, with capital invested amounting to $50,000,000, employing an army of 75,000 trained, practical and experienced men, doing an aggregate business of approximately $90,000,000 per annum. Surely, this organized selling force, located in the various manufacturing centers throughout the country, should appeal to the manufacturer as the logical outlet for his product.

There is important work here to be done, and the welding together of the interests of the jobber and manufacturer must be accomplished. The session now under way promises to be one of more than ordinary importance.

It has been the greatest pleasure to me to see in the last few years the manifest change in the growing sentiment of co-operation between jobber and jobber, and jobber and manufacturer. In some localities the keen edge of competition has been dulled by these, we might say, philanthropic sentiments born of co-operation and an ineffaceable belief that justice still sways the intentions and ambitions of our fellow men.

When the jobber and manufacturer reach that exalted station in life's work where they will realize that honesty, coupled with a regard for justice to all men, is the only policy to pursue in the conducting of their business, under all circumstances, in good times and in bad, then, and only then, will we reach that Mecca of our dreams and aspirations. "The Absolute Necessity of the Modern Machinery and Supply Jobber to the Manufacturer."

The formal opening of the New Haven Manufacturers' Permanent Exhibition, 671 to 675 Chapel street, New Haven, Conn., occurred yesterday (Wednesday). The exhibition has been launched under the auspices of the New Haven Chamber of Commerce and the New Haven Manufacturers' Exhibit Association, of which E. R. Sargent is president. The products of local manufacturers generally are to be displayed.

Strange Blast Furnace Explosion at Cleveland

While stack A of the Central blast furnaces of the American Steel & Wire Company, Cleveland, Ohio, was being blown out Wednesday night, May 8, an explosion occurred which caused the death of eight men, five being instantly killed and three dying later. Several others were injured. The cause of the explosion is a mystery and is being thoroughly investigated by the engineers of the company. According to the statement issued by S. W. Tener, manager of the accident and pension department of the company, the various steps in connection with the blowing out of the furnace were progressing as usual, with no indications of any trouble. At the time of the explosion all connections with the blast had been severed and all iron tapped out preparatory to getting the furnace into shape for relining. There was nothing in the furnace other than some burning coke resting on a bed of slag. Several of the tuyeres had been removed and all the injured, who with one exception were engaged in removing the other tuyeres, were caught in a shower of incandescent coke expelled from the tuyere openings by the force of the explosion. The furnace was well ventilated, not only through openings in the top provided for that purpose, but by additional draft through the tuyere orifices, and the conditions were considered safer than in a furnace carrying a full burden under blast.

Stove Manufacturers' Meetings

The Stove Founders' National Defense Association met in Detroit, Mich., May 7 and re-elected the following officers: President, George Mitchell, Pittston, Pa.; first vice-president, A. W. Walker, Boston, Mass.; second vice-president, Lee W. Van Cleave, St. Louis, Mo.; treasurer, William A. Dwyer, Detroit; secretary, Thomas J. Hogan, Chicago, Ill. On the recommendation of a special committee appointed a year ago some minor changes were made in the by-laws of the organization. Secretary Hogan reported that there were no important labor controversies requiring the attention of the association this spring.

The National Association of Stove Manufacturers held its forty-first annual convention May 8 and 9, also in Detroit. A number of papers on various trade and technical subjects connected with the stove industry were read and discussed. In his annual address President A. C. Mott pointed out that the primary trouble with the stove manufacturing industry is that there is a 40 per cent. surplus of manufacturing capacity, which, with obsolete methods, increases the expenses. Officers were re-elected as follows: President, A. C. Mott, Philadelphia, Pa.; vice-presidents, N. H. Burt, Leavenworth, Kan., and R. G. Rennolds, Richmond, Va.; treasurer, Frank Mixter, Rock Island, Ill.; secretary, Edward C. Hanrahan, Chicago. A banquet at the Hotel Pontchartrain was one of the features of the meeting. On this occasion Jeremiah Dwyer, president of the Michigan Stove Company, Detroit, received an ovation as the father of the city's great stove industry.

The Detroit Steel Products Company, Detroit, Mich., reports a very active demand for its solid steel Detroit-Fenestra window sash. The company has recently received orders for metal sash for new buildings for the Detroit Stove Works and Detroit Creamery Company, Detroit, Mich.; Bernheimer & Schwartz Brewing Company, New York; Stewart & Clark Mfg. Company, Chicago; Boston Cold Storage Company, East Boston, Mass.; Kaysing Iron & Foundry Company, St. Louis; Raleigh Medical Company, Memphis, Tenn., and from the Cleveland Construction Company for a power house for Fort Worth, Texas. It is also at work on a large order for sash for the Pearl Harbor Navy Station in the Hawaiian Islands.

The Adrian Furnace Company, Du Bois, Pa., blew in its blast furnace May 3, after a shut-down of one year to the day.

The Erie Forge Company, Erie, Pa., announces the opening of a branch sales office at 1406 Fisher Building, Chicago, with E. H. Lang in charge.

The blast furnace of the Pulaski Iron Company, Pulaski, Va., which has been undergoing repairs the past six weeks, was blown in May 7.

Philadelphia Foundry Foremen's Association

The Foundry Foremen's Association of Philadelphia, Pa., held its monthly meeting in Columbia Hall on the evening of May 8. C. Trivett, representing P. Isham & Co., New York, and Clarke Moore, Moore & White Company, Philadelphia, Pa., were elected to membership.

H. M. Bougher, J. W. Paxson Company, Philadelphia, addressed the meeting on "Molding Sand from the View of the Man who Digs It." He described the manner of digging the sand, its preparation, blending, etc., and said that the method of shipment had much to do with the proper mechanical mixing. He advocated strongly the purchase of boat transported sand, whenever practicable, as by the many handlings and mixings incurred a most complete blending was obtained. Rail shipments, owing to loading and unloading methods, were less uniformly mixed, and sand so received should be carefully blended or mixed by the foundryman, if satisfactory results are to be obtained. Methods of purchasing, handling and storing sand were discussed and the recommendation was made that it should be bought by sample. He said that too careful attention could not be given to the preparation and care of sand by the foundryman. This is often neglected, with the result that, even after carefully blended sand was received, the lack of care and indiscriminate use resulted in bad castings. An extended discussion followed, during which steel foundry sand, core sand and gravels were touched upon.

Massillon Iron & Steel Company's Reorganization

The reorganization of the Massillon Iron & Steel Company, Massillon, Ohio, which has been under way for several months, has finally been effected, and the company's plant, which had been idle for some time, was placed in operation May 9. The sale of $500,000 worth of preferred stock has been made and the proceeds turned into the treasury. It is stated that the company is now in sound financial condition.

C. M. Russell, president of the former company, has been elected president and treasurer of the new company and J. R. Dangler, secretary of the old company, occupies a similar position in the new organization. The plant will be in charge of W. C. Bruce as general manager. Mr. Bruce was until recently president of the Bruce-Macbeth Engine Company, Cleveland, of which he is still a director, and is president-treasurer of the Bowler Foundry Company, Cleveland. The company feels fortunate in securing a man of his experience in manufacturing and foundry lines for the management of the plant. The new sales manager is Eliot A. Kebler, recently with M. A. Hanna & Co. and formerly with Matthew Addy & Co. and the Addyston Pipe Company. Mr. Kebler has had a valuable experience as well as a long acquaintance in the pipe trade. His headquarters will be in Chicago.

Labor troubles which have been brewing for some time in the southeast Missouri lead mining district have been practically adjusted by conferences between the employers and representatives of the men. Miners have been given an advance of 25 cents per day and surface men 15 cents per day. About 5000 miners are concerned. The principal companies interested are the St. Joseph Lead Company, Doe Run Lead Company, Des Loge Consolidated Lead Company, Federal Lead Company and St. Louis Smelting & Refining Company.

The Doherty patents, covering an apparatus and process for controlling and regulating combustion in a gas producer, have been fully sustained by the United States Circuit Court of Appeals for the First Circuit which heard on appeal the case of the Combustion Utilities Corporation vs. the Worcester Gas Light Company. The latter company had appealed from the decision of the United States Circuit Court for the District of Massachusetts in favor of the Combustion Utilities Corporation.

The Alberger Pump Company, 140 Cedar street, New York, has been awarded a contract by the Isthmian Canal Commission covering 145 pumps, which are to be used in the miter gates at Gatun, Miraflores and Pedro Miguel locks of the Panama Canal.

The Machinery Markets

The machinery demand is less active in the Eastern centers than other parts of the country. New York and New England are quiet and are depending largely on export business. The convention of the Machine Tool Builders at Atlantic City and the triple conventions of the American Supply and Machinery Manufacturers' Association, the Southern Supply and Machinery Dealers' Association and the National Supply and Machinery Dealers' Association being held at Norfolk this week are attracting much attention in the trade. Chicago dealers are occupied with the Busch-Seltzer Bros.-Diesel Engine Company's $25,000 list which is expected to be closed this week and have a number of other good inquiries before them. The demand in Cleveland and Cincinnati is described as good for machinery, water wheels and mining machinery, together with miscellaneous equipment for the railroads being in particularly good call. In Detroit the many announced plans for enlargements and new factory buildings to house automobile manufacturing plants are creating an active demand for a large range of machinery. The South as a whole, in spite of setbacks of bad weather and floods, is gaining a foothold and with prospects now for a good cotton crop the outlook is particularly encouraging for cotton working and other equipment. At present the active demand is for mine pumps. St. Louis is enjoying a steady run of orders for small tools which in the aggregate amounts to a good figure. The demand for cotton gins and like equipment is being stimulated by the prospects of an exceptionally large cotton crop in Texas. New projects are being announced there daily for electrical developments of various kinds and occupy a prominent place in machinery lines. The Pacific coast is devoting its attention to the canning and mining industries and large shipments of equipment are going out of Seattle to Alaskan points. There is a brisk demand in Canada for all classes of machinery for new construction and for modernizing present plant.

New York

NEW YORK, May 15, 1912.

The machine tool business presents an unsatisfactory condition so far this month as compared with April. With but one or two exceptions dealers are dissatisfied with the amount and character of business before them. The General Electric Company, Schenectady, N. Y., is reported to be in the market for a small list of machine tools, but this is believed to be more in the nature of private buying than as a proposition for the consideration of the general trade, being for replacement of tools now in use for more modern equipment of the same makes. A local shipbuilding concern has placed orders for a few tools and a fair run of sales of special equipment are reported. Export trade continues good and some large orders have been booked. Makers of hydraulic presses and jacks in particular report an excellent demand from European countries. The domestic and foreign business combined tend to keep the shops of makers of this line going under very satisfactory pressure. Bids for the Lexington avenue extension of the subway were opened last week, upon which awards are expected to be made this week, and builders of contractors' equipment are looking forward to this business. The Delaware & Hudson Company's list is now believed to be about closed out and this leaves the trade without any important inquiry from the railroads. What business there is from this source is for single tools, mostly of an unimportant character.

The Erie City Iron Works, Erie, Pa., is inquiring in this market for an angle bending roll to handle angles up to 4 in.

The Kenny Basket Company, Geneva, N. Y., has been incorporated with a capital stock of $30,000 and will engage in the manufacture of baskets, barrels, boxes, crates, etc. Arrangements for the erection and equipment of a manufacturing plant are being completed. J. B. and M. S. Kenny and P. H. Leahy, Geneva, are the incorporators.

The Syracuse Utilities Company has prepared plans for the reconstruction of the dismantled plant of the municipal heating plant, which it has acquired for the purpose of converting it into an electric power plant. The Public Service Commission has been petitioned for permission to carry out this plan.

Certificate of incorporation has been issued to C. A. Reeve & Co., Syracuse, N. Y., with a capital stock of $50,000. The company will manufacture and deal in paints and painters' supplies. The directors are C. A. Reeve, McKlock and E. J. Rice.

The Welte Piano Company, Poughkeepsie, N. Y., is having plans prepared for a manufacturing plant which it will build in that city.

The Silica Brick & Tile Company, Watertown, N. Y., has been incorporated with a capital stock of $75,000, to manufacture brick, tile, etc., and will establish and equip a plant for the purpose. O. Watson, Watertown, and W. H. Gardner and J. F. LaRue, Philadelphia, are the incorporators.

Fire destroyed the machine shop, engine room and most of the plant of Clark Bros., Belmont, N. Y., on May 11, with a loss on buildings and machinery of $200,000. The office and pattern buildings and storage warehouses were saved. The plant will be rebuilt at once.

The Olean Electric Light & Power Company, W. R. Page, president, will erect and equip a new power plant for which site has just been purchased on Irving street, Olean, N. Y. The estimated cost of plant, with equipment, is $250,000.

The plant of the Phoenix Hardware Company, Homer, N. Y., was destroyed by fire May 10, with a loss of $100,000 on building and machinery. The building destroyed was a four-story wooden structure which will probably be replaced with a fireproof factory.

The Great Lakes Terminal Company is taking bids for a manufacturing building 36 x 133 ft., two stories, which it will erect at Oswego, N. Y.

The Minetto Meriden Company, Minetto, N. Y., has commenced the construction of its new power house, which will be of brick with steel reinforcing and will cost about $50,000. The same company will next year build a hydraulic power plant at Minetto which it is estimated will cost $225,000.

The Savage Arms Works, Utica, N. Y., has completed plans for an addition 54 x 117 ft., three stories and basement, which will be made to its factory this spring.

The W. C. Akins Machine Company, Rochester, N. Y., has been incorporated by William C. Akins, Arthur Warren and others to manufacture and repair all kinds of machinery on contract.

The Buffalo Gasolene Motor Company, Buffalo, N. Y., has filed plans for an extensive addition to its plant at Niagara street, Auburn avenue and the New York Central Railroad belt line to cost $40,000.

The Hoffman-Rooney Company, Buffalo, has been incorporated with a capital stock of $25,000 to manufacture pianos and musical instruments. C. F. and H. C. Hoffman and J. F. Rooney are the incorporators.

The Progressive Structural Company, Buffalo, has been incorporated with a capital stock of $50,000 by P. W. and E. Wurtz, A. J. Ackerman, C. T. Moebus and E. W. Holt. It is understood the new company is to take over and continue the structural steel fabricating and erecting business of Wurtz & Son, which has an extensive structural steel fabricating plant at Bailey avenue and the Pennsylvania Railroad.

The Fedders Mfg. Company, Buffalo, manufacturer of radiators for automobiles, has commenced construction of an addition to its power plant at Tonawanda street and West avenue.

The D. H. Stoll Company, Buffalo, manufacturer of presses and die machinery, will enlarge its plant at Lansing street and the New York Central Railroad belt line by the addition of a two-story brick factory building.

The German Roman Catholic Orphan Asylum, Dodge street and Parade avenue, Buffalo, has let the contract for the construction of a power plant, with boiler house and laundry building, to cost $30,000.

The Lumen Bearing Company, Buffalo, has filed building plans for an addition it will make to its plant at Sycamore and Lathrop streets and the New York Central Railroad belt line.

The C. Klinck Packing Company, Buffalo, will build an extensive addition to its plant at Depot street and the Erie Railroad. Modern equipment will be installed.

New England

BOSTON, MASS., May 14, 1912.

The market has chaged very little since last week. If anything buying is a little more free and inquiries are encouraging. The convention of the National Machine Tool Builders at Atlantic City this week will have a large attendance from New England. The week has seen two transactions of exceptional interest—the reorganization of the Waltham Watch Tool Company, Springfield, Mass., as the Van Norman Machine Tool Company, with the entrance into the business of Clarence E. Wetsel, and the consolidation of ownership and management of the chuck business of the E. Horton & Sons Company and the S. E. Horton Machine Company, Windsor Locks, Conn.

The Reed-Prentice Company, Worcester, Mass., is consolidating its offices at the F. E. Reed plant on Gold street. The old main offices of the other companies which are united in the new corporation—the Prentice Bros. Company, Reed & Curtis Machine Screw Company and the Reed Foundry Company—will hereafter be used for administrative purposes only. An executive board has been appointed by the board of directors, consisting of A. E. Newton, the general manager; F. E. Reed, George F. Fuller, Lucius J. Knowles and Frank A. Drury.

The Van Norman Machine Tool Company, Springfield, Mass., a new corporation, has taken over the business and property of the Waltham Watch Tool Company of that city. Frank H. Page, president of the National Equipment Company, Springfield, is president of the new company; Clarence J. Wetsel, for eight years treasurer and general manager of the Baush Machine Tool Company, is the treasurer; Charles E. Van Norman, vice-president, and Fred D. Van Norman, secretary. The authorized capital stock is $400,000, divided equally between common and preferred. Most of the stock is held by Springfield men. The company will continue the manufacture of the Van Norman duplex milling machine, universal bench lathe, bench milling machine and internal grinding machine, and will add other lines to its product. The factory on Wilbraham avenue is large and modern, and there is room on the property for ample extension. The company now occupies two of the three floors and will take the entire building, the upper story having been vacated by the Parker Transmission Company. The business was founded by Charles E. and Fred D. Van Norman about twenty years ago and was first located at Waltham, Mass. Their father, Caleb Van Norman, had been in the watch tool business before them.

The ownership of the business of the E. Horton & Son Company, and of the S. E. Horton Machine Company, Windsor Locks, Conn., manufacturers of chucks, has been consolidated by the purchase by representatives of the family of the late Stoddard Ellsworth Horton of the stock held by Ezra B. Bailey and his associates, and the management of the combined industry will hereafter be in the hands of Sidney Ellsworth Horton, son of the late Stoddard Ellsworth Horton, and grandson of Eli Horton, the founder of the business. Mr. Bailey retires. In about 1892 Mr. Bailey, whose wife is a daughter of the first Eli Horton, and his associates gained control of the E. Horton & Son Company, but under an agreement that should they ever decide to part with this control it should first be offered to the family of Stoddard Ellsworth Horton. During this period the affairs of the corporation have been successfully managed and the business has steadily gained in prestige, in volume and in financial strength. Finally Mr. Bailey decided to lay down the management, and consequently, in accordance with the agreement, his stock and that of his associates was offered to the Horton family, and last week the ownership passed to the decendants of Eli Horton. Sixty-two years ago this pioneer truck manufacturer moved to Windsor Locks from Union, Conn., and with his son patented and made the first geared universal truck ever designed. S. E. Horton has been actively identified with the businesss since 1891 and was the superintendent of the E. Horton & Son Company's works from 1896 to 1905. For a few years past he has been engaged with an independent business with a similar product bearing his name.

The Oakland Foundry & Machine Company, Oakland, Maine, has been organized with an authorized capital stock of $10,000. The company will do a general foundry and machine jobbing business. The plant has been in operation for some time and the foundry is in good condition, but some additional machine tools will be required. E. T. Mitchell, Oakland, is the president and E. E. Crowell is the treasurer.

Important changes, amounting to a reorganization, have been made in the personnel of the management of the Universal Machine Screw Company, Hartford, Conn. New directors and a new general superintendent have been elected. The board of officers is now made up as follows: President, Charles Phelps, Rockville, Conn.; vice-president, Thomas W. Russell, Hartford; secretary and treasurer, F. Goodwin Smith; general superintendent, George B. Pickop, recently master mechanic for P. & F. Corbin, New Britain; directors, all Hartford men, A. H. Pease, president of the Hart & Hegeman Mfg. Company; Geo. E. Sykes, president of the George E. Sykes Company; C. E. Bond, secretary and treasurer of the Spencer Turbine Cleaner Company; Charles L. Taylor, president and manager of the Taylor & Fenn Company; Frank L. Wilcox, president of the Fidelity Trust Company, and William A. Lorenz, patent solicitor and inventor of note.

The Sterling Vacuum Cleaner Company, Worcester, Mass., has established a factory at 86 Foster street. Frederick H. Fisher, Hartford, Conn., is the president and treasurer, and the other directors are Olof G. Hedlund and Eric G. Thoreen, both of Worcester.

The Dover Machine Works, 45 Broadway, Dover, N. H., is bringing out an entirely new line of standard types of wood working machinery, specializing on band saws, saw benches, buzz planers and boring machines. The company is composed almost entirely of men who for years were associated with the John A. White Company. Joel F. Sheppard, 2nd, has sold out his interest in the White Company and is the proprietor of the Dover Machine Works. G. H. Mills, the superintendent, formerly occupied the same office with the older company.

The Laconia Car Company, Laconia, N. H., the business of which has recently been taken over by a new corporation having a large working capital, states that it is not yet making preparations for changes and improvements to its works.

The Lincoln County Lumber Company, Bath, Maine, has been organized to establish a plant at a cost of about $100,000 to manufacture wooden boxes.

Philadelphia

PHILADELPHIA, PA., May 10, 1912.

Contracts covering any important equipment purchases are few and far apart. While a fair volume of inquiry continues to come out, there is a marked hesitancy in the placing of orders, particularly when the intended purchase is of any size. The major portion of the week's sales has been confined to small equipment, usually single tools, on which prompt delivery is generally specified. Competition for what business is offered continues keen and prices show little material hardening. Some builders of special tools and machinery are better engaged, and a slightly better volume of business has developed; general tool makers, however, are still complaining of the lack of orders and in a number of instances plant operations are no better than they were several months ago. The local locomotive builder has again been favored with a fair volume of orders and takes a rather optimistic view of the situation.

While the railroads have been good buyers of cars and rails, their requirements as to machine tools have, at least in this territory, been extremely meagre. Few inquiries for electric cranes have developed. In the boiler and engine field new business has not been particularly active, although makers are comparatively well engaged with work on their books. The second-hand machinery market shows irregularity, a fair business is moving in some lines, but considerable room for improvement is reported. The better demand recently reported for steel castings appears to be maintained, some good orders coming to plants in this district. Gray iron foundries report little change in conditions, although what there has been was in the direction of improvement.

The contract for the new Hotel Vendig, to be built at Thirteenth and Filbert streets, for Charles H. Vendig, 1922 North Twelfth street, has been practically

awarded. The building will be of steel frame construction, and an extensive power plant, including steam, electricity and refrigeration, will be installed. Proposals for the power plant have not yet been sent out.

William Beckman will, it is stated, erect a one-story public garage, 21 x 105 ft., to be built on Conestoga street below Thompson. Proposals for the erection of the building are being asked.

The Bergdoll Machine Company has made arrangements for an additional building in connection with its recently acquired site at Trenton Junction, N. J., where it proposes to manufacture automobile transmission, axles and other parts. The company intends erecting a foundry for the making of various castings.

Proposals will be received until May 20 by Herman Loeb, director of the Department of Supplies, Room 312, City Hall, city of Philadelphia, for eight two-horse road rollers and trap rock screening for the Bureau of Highways.

The Steel Heddle Company, Twenty-first and Lippincott streets, is taking estimates on a one-story reinforced concrete building, 58 x 100 ft., to house a new power plant. The contract for the power equipment, including boiler and direct connected engine and generator, has already been awarded, although that for the building has not yet been given out.

Bids have been taken by Frederick Weber, architect, Morris Building, for a factory building, 40 x 78 ft. and five stories, of brick and concrete to be erected at Willow and Orianna streets. Electric lighting, steam heat and an electric freight elevator were included in the bids.

The Philadelphia Rapid Transit Company, which has recently purchased some 31 acres in the northeastern section of the city, will, it is reported, erect there two large buildings, one to be used as a car shop and repair works and the other as a terminal to accommodate about 500 cars.

The Bell Telephone Company is planning for the erection of a three-story fireproof Exchange Building, to be erected at Broad and Rockland streets. Detailed plans are not ready, although it is understood that considerable equipment in connection with the service will be required.

The Baldwin Locomotive Works has received a number of orders in the past week, including one for 22 engines from the St. Louis & Southwestern Railroad and 9 from the Missouri & Gulf Railroad. Orders for a number of individual engines were also received. This company is very much encouraged with the outlook for business and is gradually increasing its working force. Employees now aggregate 10,500 and the number is being increased weekly, dependent upon the ability to obtain deliveries on raw material.

The establishment of Thomas Yearsley, 211 N. Third street, Philadelphia, Pa., dealer in electric motors, dynamos and generators, was recently visited by fire. The damage was very slight and will in no way inconvenience the general conduct of business.

Chicago

CHICAGO, ILL., May 14, 1912.

The month of May has failed to bring out any quantity of machinery business thus far, and interest centers for the most part in deals still pending from the previous month. It is expected that the Busch-Sulzer Bros.-Diesel Engine Company's inquiry amounting to about $25,000 will be placed at the beginning of the coming week. The Canadian Pacific list remains unclosed, which is also true of the small Santa Fe inquiry. A nearby steel foundry which is to enlarge its plant to include a roll foundry is in the market for three cranes, roll lathes and a fair size list of regular machine shop equipment. The Beloit, Wis., manufacturer whose inquiry was mentioned last week has not yet provided for its requirements, and an inquiry from a Michigan manufacturer is also noted.

The Western Hardware Mfg. Company, Chicago, has been incorporated with a capital stock of $5,000 to engage in the manufacture of metal specialties. The incorporators are O. S. Baylies, A. C. Noble and Joseph J. Guler.

The Elevator Engineering Company, Chicago, has filed notice of a change of name to the Prince Elevator & Machine Company, and of an increase in capital stock from $5,000 to $20,000.

The Commercial Furniture Company, West Superior street, Chicago, has taken out building permits for a three-story factory building to cost $20,000.

The American Sharpening Machine Company, Chicago, has been organized with a capital stock of $10,000 by Raphael S. Green, F. M. Halloway and B. C. Thorpe.

The Hubbard Steel Foundry Company, East Chicago, Ind., has filed application for an increase in its capital stock from $400,000 to $500,000, to provide for the erection of a roll foundry 160 x 165 ft. A 40-ton and a 10-ton crane, and a 10-ton gantry crane will be installed. A machine shop 75 x 120 ft. also will be erected. For this shop a number of new tools will be required, including an 8-ft. planer, 5-ft. horizontal spindle mill, five roll lathes, an 8-ft. vertical boring mill, a gear planing machine with a range suitable for handling spur gears up to 20 ft. in diameter, and bevel gears 14 ft. in diameter. A considerable quantity of other machine shop equipment will be purchased.

The Leavitt Mfg. Company, Urbana, Ill., has let the contract for an addition to its foundry.

The General Mfg. & Novelty Company, Elgin, Ill., has been incorporated with $12,000 capital stock by A. A. Bleinberg, W. D. Martin and W. F. Bultman to equip a plant for the manufacture of novelties.

The F. M. Delaih Cooking & Heating Device Company, Evanston, Ill., has been incorporated with $25,000 capital stock by F. M. Delaih, T. C. Saunders and W. H. Smith, and will equip a plant for the manufacture of a new cooker.

The Syracuse Wagon Works has filed notice of a change in its name to the DeKalb Wagon Works, and of the removal of the company's plant to DeKalb, Ill.

The Illinois Terminal Railroad Company, Alton, Ill., suffered a loss of $50,000 in the burning of its car shops May 3. A quantity of new machinery was seriously damaged.

The George D. Whitcomb Mining Machinery Company, Rochelle, Ill., is planning the erection of a new plant in that city.

University of Illinois plans an expenditure of $900,000 in new buildings, one of which will be a mechanical engineering laboratory.

The Carborite Steel Bit Company, Springfield, Ill., has been licensed to incorporate with a capital stock of $5,000 for the purpose of manufacturing metal products. The incorporators are George A. Miller, M. L. Goodrich and Albert H. Raessler.

Proposals will be received by the Board of Education, Dubuque, Iowa, until May 29, for the erection of a new school building.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, will build a new power house to cost $20,000 to provide for new boiler, engine and electric generating capacity.

The H. J. Frank Foundry Company, Davenport, Iowa, is erecting a modern foundry building, 80 x 50 ft., one-story brick, a part of which will be used as a machine shop. All of the equipment has been purchased and the company expects to commence operations in the latter part of June.

Cleveland

CLEVELAND, OHIO, May 14, 1912.

The demand for machine tools is light. Dealers report few sales in the week and little inquiry. Very little business is coming from large plants except for occasional tools for replacements. The demand for special tools is more active than for standard tools. The May volume of business so far shows a falling off as compared with April. Dealers look for an improvement in the demand when a number of manufacturers in this city and vicinity, who are planning or have under way plant additions or new plants, are ready to place orders for equipment. The demand for second-hand machinery is only fairly active. There is a large quantity of used machinery on the market. Inquiry for some lines of special heavy machinery shows an improvement. This includes water wheels and mining machinery. In power plant equipment there is a good volume of business in prospect, mostly in small installations. Greater activity in building lines this month indicates an improvement in the demand for equipment for small power and heating plants. In the foundry trade the jobbing foundries are fairly well filled with work.

The Iceless Refrigeration Company, Cleveland, has secured possession of the plant and machinery at East 72nd street and the Lake Shore tracks formerly used by the Royal Tourist Car Company and has commenced to manufacture its machines at its new plant. The company has moved its offices from the Hippodrome Building to the plant.

The Mayer Realty Company will erect a 3½-story factory building at Lakeside avenue and East Tenth

street, Cleveland. It will be occupied by the Ideal Paper Box Company.

The W. S. Tyler Company, Cleveland, has placed a contract with the Hunkin-Conkey Construction Company for a new factory building. It will be 100 x 198 ft., four stories, of brick and reinforced concrete construction.

The Craig Foundry Company, Bucyrus, Ohio, has commenced the erection of an addition to its plant.

The Lake Shore Railroad has resumed work at Elkhart, Ind., on the large shops that were planned at that point two years or more ago. At that time a large machine tool list was prepared but because of a retrenchment policy inaugurated this list was never given to the trade. The building of a power plant in connection with the proposed shops is now under way and it is stated that the company intends to have the entire shops completed in the fall of 1914.

The Akron Rubber Mold & Machine Company will build a new machine shop. The building will be of brick and steel construction, two stories.

L. F. McGrath is planning the erection of a large garage and automobile repair shop on Superior avenue, N. E., near East Twelfth street, Cleveland.

The Toledo Water Power Vacuum Cleaner Company, Toledo, Ohio, has been organized with a capital stock of $25,000 by W. G. Yenser, E. F. Yenser, E. W. Junk, George D. Babcock and J. W. Schwab.

The Jefferson Glass Company, Follensbee, W. Va., has let a contract for the erection of a factory building, 60 x 232 ft., three stories, brick and stone.

The new plant of the Ohio Steel & Wire Company, Warren, Ohio, the erection of which has just started, will include a one-story main building 100 x 180 ft., a two-story wing 80 x 475 ft., a two-story office building 40 x 60 ft., and a one-story machine shop 60 x 80 ft. E. A. Henry, president of the company, has established offices in the Trumbull Block, in Warren.

The Angell Nail & Chaplet Company, Cleveland, Ohio, has been organized with a capital stock of $24,000 and has established a plant at 5407 Sweeney avenue. The company will make wire nail specialties and chaplets. Their nail products will be largely foundry nails. George W. Angell is president and manager.

The Ohio Blower Company, Cleveland, Ohio, which is building a new plant, will be in the market shortly for tools and for machine shop equipment.

The Owens Bottle Machine Company, Sidney, Ohio, will build a new one-story brick and steel plant to replace the one recently destroyed by fire.

The plant of the East Palestine Pottery Company, East Palestine, Ohio, was destroyed by fire May 5, the loss amounting to about $125,000. The only portion of the plant that escaped the flames was the engine and boiler rooms. The plant will probably be rebuilt.

The Sash Hanger Company, East Liverpool, Ohio, will shortly begin the erection of a new plant.

Cincinnati

CINCINNATI, OHIO, May 14, 1912.

The majority of reports from machine tool builders in this section indicate a slow but steady improvement. The railroad business is fairly good, and the export trade is also occupying much attention.

Both steam and electrical power plant equipment is in good demand, but business from the South is reported to be slackening up. Second-hand machinery dealers are doing a good business, and look for a busier season later on. A number of local foundries report an increase in their melt during the past 10 days.

It now seems certain that bids will be asked for, before the year has passed, for the construction of the proposed union depot at Cincinnati. It is estimated that about 160,000 tons of structural material will be required for this structure.

As evidence of improving conditions, the Cincinnati Planer Company, Oakley, Ohio, reports the past three months as being the best period it has enjoyed since the boom times of 1907. It is also stated that the next quarterly report to be issued by the Cincinnati Metal Trades Association will show over 10 per cent. greater activity than the report of March 15 indicated.

John C. Thoms, Cincinnati, manufacturer of sash, doors and blinds, is buying additional equipment for his present plant. He also has plans under way for erecting a larger factory on Price Hill some time during the summer season.

The Globe-Wernicke Company, Cincinnati, is moving into its new plant at Norwood, Ohio, a Cincinnati suburb. It is understood that some additional electrical equipment will be required.

The Crane & Engineering Company, Columbus, Ohio, was recently incorporated to deal in conveying, hoisting and power transmission machinery. Paul T. Norton and R. N. Platt are named among the incorporators.

A glass factory will be constructed by the Hancock Mfg. Company, at Norwalk, Ohio.

The Goemann Grain Company, Toledo, Ohio, has awarded the contract for a large grain storage elevator to be erected at Mansfield, Ohio.

The Heer Engine Company, Portsmouth, Ohio, manufacturer of gasoline traction engines, has increased its capital stock from $125,000 to $250,000, and will soon add to its manufacturing facilities.

The C. M. Thompson Mfg. Company, Newark, Ohio, has been incorporated with $35,000 capital stock to manufacture hose clamps and other railroad specialties. C. M. Thompson and E. F. Ball are among the principal incorporators named.

Architect C. W. Bates, Wheeling, W. Va., will soon be ready to receive bids on the structural steel and power plant equipment required for a large hospital to be erected at that point.

On May 14 several hundred members of the Cincinnati Business Men's Club were entertained at a luncheon given by the University of Cincinnati, after which an inspection of the new engineering building was made, of which department Dr. Hermann Schneider is the head.

The Kentucky Solvay Coke Company, Ashland, Ky., has been incorporated with $650,000 capital stick, by E. L. Pierce, J. G. Hazard and others. Nothing is known as to the company's operating plans as yet.

A small repair shop will be installed in a garage to be erected by the Gem Garage Company, Springfield, Ohio, recently incorporated with $10,000 capital stock. Charles J. Watts is named among the incorporators.

Power plant and electrical equipment will be needed for the proposed Lima State Hospital, Lima, Ohio. The Board of Commissioners will open bids June 7. Frank L. Packard, Columbus, Ohio, drew up the plans for the building, and has them on file in his office.

Indianapolis

INDIANAPOLIS, IND., May 14, 1912.

Charles H. Byfield, architect, Indianapolis, has completed plans for the erection of the Mansur-Wulsin power building to be erected in that city at a cost of $100,000. Equipment will be installed in the building suitable for furnishing power to manufacturing concerns.

The Pennsylvania Railroad Company will build a new roundhouse in Indianapolis to cost $200,000, according to notice received by Superintendent J. W. Coneys from the general office. The roundhouse will be 375 ft. in diameter, will have 34 engine stalls, and its 85-ft. turntable will be operated by electricity.

The Vixen Motor Company, Indianapolis, recently incorporated, will control the rights of the Vixen rotary valve motor. The officers are: President, Fred C. Schmid; vice-president, William J. Harris; secretary-treasurer, C. O. Van Horn. The first engine is now being tested.

The Marion Motor Car Company, Indianapolis, has been reorganized and the capital stock increased from $100,000 to $1,125,000. Most of the stock has been taken by J. I. Handley, president American Motors Company, this city, and John N. Willys, president Willys-Overland Company, Toledo, Ohio. Another large plant is to be built in Indianapolis, in order to increase the output of Marion cars for the 1913 season to 4000. James I. Handley is president of the new organization.

The National Toy & Mfg. Company, Indianapolis, has been incorporated with $20,000 capital stock to manufacture toys and other articles. The directors are McCutcheon Gregory, E. G. Brockenbrough and L. H. Van Friggle.

The H. J. Ash Furnace Company, Ft. Wayne, Ind., has been incorporated with $6,000 capital stock, to manufacture and deal in furnaces. The directors are H. J. Ash, A. H. Landwehr and C. H. Landwehr.

Supple & Foseman, Danville, Ill., will build a factory at Evansville, Ind., for the manufacture of cement posts.

Grafton Johnson, Greenwood, Ind., is at the head of the Northern Wisconsin Canning Company, Indian-

apolis, incorporated with $100,000 capital stock to do a canning business in Wisconsin. The other directors are C. G. Morris and E. A. McAlpin.

The Ladoga Veneering Mill, Ladoga, Ind., was burned May 5, with $40,000 loss and $10,000 insurance. It was owned by Harry Daugherty of Ladoga and R. C. Scott of Crawfordsville, Ind.

The Standard Rubber Tire Company, Hessville, Ind., has been incorporated with $20,000 capital stock to manufacture tires and other rubber articles. The directors are E. D. Loewenthal, O. A. Wheeler and Harry Williams.

The Schwartz & Olson Company, Logansport, Ind., has been incorporated with $10,000 capital stock, to deal in sheet metal. The directors are Otto Schwartz, Linus Olson and A. E. Schwartz.

The brick plant of the Indiana Brick Company, Anderson, Ind., was destroyed by fire, May 2, with a loss of $100,000. The plant will be rebuilt on the old site.

Detroit

DETROIT, MICH., May 14, 1912.

Business is better, both merchants and manufacturers reporting greater activity and increasing inquiries. A number of sales of small lots of metal-working tools have been made, together with a goodly run of single tool propositions. The interest of the trade is largely centered locally at present, the upstate markets, with the possible exception of Grand Rapids, being comparatively quiet. The automobile companies continue to announce plans for still further extending their plants and increasing their capacity, and the automobile accessory industry is correspondingly active; conditions which are arousing much interest among machine tool dealers. The demand for engines and boilers is reported as rather dull, with sales confined to the smaller class of installations. Machine shop equipment and supplies are responsible for a considerable amount of business the past few weeks. Structural work shows a steady gain, though the permits for new buildings issued so far this month show a falling off in large propositions.

All doubts concerning the retention by this city of the plant of the Cadillac Motor Car Company have been set at rest by the announcement this week of the purchase by the company of the site and buildings of the Long Mfg. Company, a tract on Cass avenue, 145 x 320 ft., south of and adjacent to the company's present plant. The transactions involved an expenditure of approximately $150,000, and will permit of a considerable expansion in the manufacturing facilities of the Cadillac Company.

The Long Mfg. Company, manufacturer of automobile radiators, hitherto operating under an Illinois charter, has been incorporated under the Michigan laws with a capital stock of $300,000. The incorporators are Frederick H. Rike, Edward B. Fleisch and Joseph McDowell. The company has purchased a factory site, 120 x 270 ft., on Grand Boulevard, between Cameron and Richmond avenues, and will erect a new factory double the size of its present quarters on Cass avenue.

The Abbott Motor Company has acquired 300 ft. frontage on Beaufait avenue, adjoining its present plant, and is having plans prepared for a factory extension which will provide for a 25 per cent. increase in the capacity of its plant.

It is announced that the Parrish Mfg. Company of Reading, Pa., manufacturer of automobile frames, will build a branch plant in this city. The company has secured a site on the outer belt line, but is not yet ready to announce details in regard to the new plant. The company's temporary offices are in the Ford Building, in charge of C. M. Hall.

The Detroit Horseshoe Company, Detroit, has been incorporated with $100,000 capital stock to manufacture horseshoes and kindred articles. The company will take over the plant and business of the J. B. Cowhey Improved Horseshoe Company. The incorporators include Henry B. Boerth, Harry H. Jones and J. B. Carokey.

The Tessmer Machine & Tool Company, Detroit, manufacturing machinist, is erecting a one-story brick addition, 40 x 45 ft., to its plant at 289 Rivard street. Not much new equipment will be required at present. The company reports an excellent volume of business.

The American Brass & Iron Company, Detroit, has awarded the contract for its new factory to the Frost-Winchester Company. The new building will be 41 x 153 ft., of reinforced concrete construction, and will be modernly equipped. A new boiler house will also be erected. The company has recently completed a new foundry building, 37 x 82 ft., and with the completion of the new structure the capacity of the company's plant will be nearly tripled.

The large factory building at 210-212 Catherine street, housing the Wolverine Motor Castings Company, the Wayne Shoe Company and the assembly department of the Wolverine Motor Supply Company, was destroyed by fire May 7, causing a heavy loss. The several companies expect to make speedy arrangements toward resuming operations.

The Original Gas Engine Company, Lansing, Mich., will erect a factory building which will treble the company's present capacity. The building will be 125 x 300 ft., two stories, of brick construction. The company is a large manufacturer of both water and air-cooled engines.

The Monroe Machine Company, Kalamazoo, Mich., has been organized with a capital stock of $100,000 for the purpose of manufacturing a patented calculating machine. The incorporators include J. R. Monroe of New York and A. B. Connable and C. A. Peck of Kalamazoo. The executive offices of the new company will be located in New York City.

The Dudly Tool Company, Menominee, Mich., manufacturer of wrenches, etc., is erecting an addition to its plant 40 x 60 ft., and will install equipment sufficient to double its output. At the annual meeting officers were elected as follows: Henry Tideman, president; E. Guensburg, treasurer, and W. J. Tideman, secretary and general manager.

The Kalamazoo Fiber Package Company, Kalamazoo, Mich., has been organized with $25,000 capital stock, and will soon equip a plant for the manufacture of folding fruit boxes. The incorporators of the new company are Clarence Thorne, R. A. LeRoy and William Grace.

The Wyandotte Foundry Company, Wyandotte, Mich., which has completed the building of its new plant, has closed contracts for the manufacture of 1000 furnaces a year in addition to its ordinary business, and will now erect an additional building to provide for an assembly department.

It is reported that the Kalamazoo Buggy Company, Kalamazoo, Mich., is planning to considerably enlarge its automobile manufacturing department.

The L. J. Petit Salt Company, Milwaukee, Wis., has acquired an extensive salt property at Ludington, Mich., including a manufacturing plant, docks and warehouses. It is said that a new plant will be built on a much more extensive scale. J. C. Post is general manager.

The Eddy Paper Company, Kalamazoo, Mich., has been reorganized and has increased its capital stock to $160,000. The company will operate paper mills at Three Rivers and White Pigeon, Mich. The latter is being completely rehabilitated. Frank Milham is president and Henry M. Eddy, general manager of the reorganization.

The Criswell Furniture Company, Grand Rapids, Mich., has increased its capital stock from $10,000 to $25,000 to finance its merger with Doezma & Burns and to provide for plant extensions.

The J. B. Stone Company, Grand Rapids, Mich., has increased its capital stock from $25,000 to $45,000. The company manufactures belt lacings and other specialties and will soon occupy its new factory building now being erected.

The Covel Mfg. Company, Benton Harbor, Mich., manufacturer of saw machinery, has begun the construction of a new warehouse, 50 x 120 ft.

The Charles P. Limbert Company, Holland, Mich., manufacturer of furniture, has increased its capital stock from $100,000 to $300,000 to provide for plant extensions.

The Inner Brace Chair Company, Grand Rapids, Mich., has been incorporated with $1,000 capital stock to manufacture furniture braces. Arthur B. Russell, Schoolcraft, Mich., is the principal stockholder.

The National Piano Mfg. Company, now located in Chicago, has secured factory quarters on Market street, Grand Rapids, Mich., and will shortly remove its business to that city. Clarence U. Clark has been elected president of the company.

Gardner S. Williams, engineer, Ann Arbor, Mich., has completed plans for the hydraulic power plant to be erected by the Eastern Michigan Edison Company at Ann Arbor. The plans call for a plant capable of generating 2000 hp.

The South

LOUISVILLE, KY., May 14, 1912.

Conditions in this section are beginning to look up, and the general opinion is that the situation is better. Good weather is improving the aspect of agricultural affairs, for it looks as if the wheat crop, which was termed a failure, will come nearer to normal proportions, and as if a corn crop can be put in in spite of the late spring and the rains and floods which made it impossible to plant at the usual time. As Southern territory, in spite of the growth of manufacturing interests, is still primarily an agricultural community, these conditions are of considerable importance, and more attention is given them than would be the case in other sections.

The demand for strictly power equipment is falling off, but this is made up for by the call for boilers to be used in heating plants for big office buildings, of which a considerable number are being erected in this vicinity. This is the chief consuming channel for most lines just now.

The Louisville office of Fairbanks, Morse & Co. reports the sale of an 80-hp. oil engine for operating a cotton gin. This is somewhat out of the ordinary, as most of the gins are run by steam. The advantages of the new power unit are that it can be operated with a low grade of oil and is much more economical than steam power.

The organization of the Louisville Steel & Iron Company, which has been pending for the past six months, is still in *statu quo*, and final arrangements for putting the plant of the old Louisville Bolt & Iron Works in commission have not yet been completed. Those interested, however, say that plans for the active operation of the company are proceeding satisfactorily.

The R. E. Harryman Machine Company, Louisville, is installing motors of the James Clark, Jr., Electric Company, for the operation of its machines, and has doubled its floor space. It may require a few machine tools, such as a drill press and a milling machine, a little later on.

The Brandeis Machinery & Supply Company, Louisville, has sold the city of Louisville an Ingersoll-Rand outfit consisting of a boiler, pump and rock drill.

The Falls City Plumbing Supply Company, Louisville, has entered the mill and plumbing supply trade.

The plant of the McMillan Mfg. Company, Louisville, which was recently burned, will probably be rebuilt. The power equipment was not damaged, but the wood-working machinery will have to be entirely replaced. The loss was $20,000.

The Charles R. Long, Jr., Company, manufacturer of railway paints, which has a plant at 622 East Main street, Louisville, will probably make some additions to its plant in the near future.

J. J. McMillan, Dover, Ky., will install a coal elevator to enable coal from barges to be handled and stored.

The Owensboro, Ky., plant of the American Milling Company has been closed and operations may not be resumed, it is reported. The company recently filed a mortgage for $350,000 on the plant.

L. B. Herrington, president of the Richmond Lighting Company, Richmond, Ky., has stated that the financing of the construction of the plant of the Dix River Power Company, which was recently incorporated, has been provided for, and that work will begin as soon as plans have been completed.

The Kentucky Freestone Company, Mt. Vernon, Ky., is preparing to erect a cut-stone plant.

The Little Blaine Oil & Gas Company and the Hamilton-Roberts Company have been organized at Louisa, Ky., and will begin the development of oil property in the near future.

The Kentucky Midland Coal Company, Central City, Ky., is considering the construction of a traction line from Central City to its mines, which are a short distance from that point.

The Burley Tobacco Company, Lexington, Ky., will erect reinforced concrete tobacco warehouses at Frankfort, Shelbyville and Maysville, Ky. F. J. Manly, Lexington, is drawing plans for the structures.

It is reported that the Cincinnati Locomotive & Car Works, Cincinnati, Ohio, is considering plans to locate at Ludlow, Ky., a suburb of Covington. It is stated that the company is to reorganize with larger capital, and is considering plans for a new plant.

The Memphis Steel & Construction Company, Memphis, Tenn., has been given the contract for the erection of a steel tank for the new water plant of Murray, Ky.

Phelps & Son, Cloverport, Ky., will erect a button factory. The city has given the concern a free site for the erection of its plant.

The City Council of Madisonville, Ky., is considering the creation of a board of public works which will take charge of the erection of a $75,000 waterworks system which will be built with the proceeds of a recently authorized bond issue.

The Williams Staggle Oil Company, Lexington, Ky., has been incorporated with $12,000 capital stock by Rex G. Carpenter and Opal G. Carpenter, of Monticello, for the purpose of developing oil property in Wayne County, Ky. Offices will be in Lexington.

Plans are now being drawn for the 7-story reinforced concrete building of the United American Insurance Company, Frankfort, Ky. An electric elevator and a heating plant will constitute the equipment of the building.

A new gas-making plant is to be installed by the Kentucky Public Service Company at Frankfort, Ky. Coal gas instead of water gas will be manufactured. The electric light plant is also to be improved, as heretofore reported. Address the company at Frankfort.

A. J. Baker and J. H. Mayes are considering the erection of a flour mill at Marion, Ky. The plant will be electrically operated.

The Moss Milling Company, Greensburg, Ky., is installing an electric light plant.

The Kentucky River Stone & Sand Company, Lawrenceburg, Ky., is in the market for a pumping outfit, conveying machinery and other equipment to be used in handling sand. T. B. Ripy is general manager of the company.

Electrical equipment is wanted by the Farmers' Loose Leaf Tobacco Warehouse, Carlisle, Ky. J. W. Burns is in charge of the installation.

H. L. Pittmann, Pineville, Ky., is organizing a company to make an improved motor-driven sewing machine. A site for a plant has been secured, and buildings will be erected this fall. For the present the machine will be made by contract.

Kent C. Barber, Bardstown, Ky., will purchase equipment for a cold storage plant in the immediate future, work on the building having already begun.

Edward Manion, Henderson, Ky., has been awarded a contract for the construction of a reinforced concrete well and sewer line, the contract calling for the installation of an electrical pump in the well, which is to be used for the purpose of changing the direction of the flow of sewage.

The Marion Electric Light & Ice Company, Marion, Ky., which has restricted its service to lighting at night, intends to install additional equipment to enable it to furnish current for power during the day.

A reinforced concrete building is to be erected at South Main and Butler streets, Memphis, Tenn., by J. M. Toohey for the use of the Allen Engineering Company, machinery manufacturer.

The Nashville Gas & Heating Company, Nashville, Tenn., has increased its capital stock from $100,000 to $3,100,000. It has secured a new franchise and will make a number of important improvements in its plant.

The gas plant at Clarksville, Tenn., will be rebuilt by the Kentucky Public Service Corporation, which will operate the property. Control of the Clarksville Gas Company and the Clarksville Railway & Light Company, as reported, passed recently to Philadelphia interests which organized the public service company.

R. Brinkley Snowden, Memphis, Tenn., has announced plans for the construction of a 400-room hotel to cost $1,000,000. It will be of reinforced concrete construction.

J. E. Gibbs, Burns, Tenn., has secured a site and will erect a plant for the manufacture of tight cooperage material.

The Virginia Bridge & Iron Company, Roanoke, Va., which has a branch plant in Memphis, Tenn., will make improvements there costing $50,000. These will consist of extensions of the crane runways and the installation of additional punching, shearing and riveting equipment. The company will manufacture the structural material used.

The Brookside Cotton Mills, Knoxville, Tenn., will erect an addition to its plant and install 200 additional looms. The cost of the improvements will be $100,000. James Maynard is president of the company.

The National Mosaic Flooring Company, Mobile,

Ala., will erect a factory at Memphis, Tenn. William F. Tebbetts is president of the company.

Birmingham

BIRMINGHAM, ALA., May 13, 1912.

There has been no great demand for machinery recently, but there have been fair sales, with a general anticipation of better conditions prevailing in the lumber and cotton gin trades. Both of these industries have been much hampered by the wet weather and the trend to buy for the season's business has not well set in. A good quantity of mine pumps, however, has been sold, and the demand in that quarter continues to be steady and good. There has been a general slowness all along the line, but with the clearing of the weather and the final settling in of the summer season with autumn anticipations better trade is looked for. As a general proposition machinery is going moderately in standard lines, with prospect of bigger business ahead in the next two months.

The Fuller Elevator & Equipment Company, Birmingham, has been incorporated with a capital stock of $30,000 to manufacture elevators. The incorporators are Allen A. Fuller, C. S. Simmons and R. D. Johnston, Jr.

James H. Mitchell, of Montgomery, states that the Alabama Interstate Power Company will commence work on the Coosa River within 30 days constructing a dam to generate water power. The power house, distributing system, etc., will, it is claimed, cost in the neighborhood of $6,000,000. English, Canadian and Northern capitalists are reported as interested.

The Birmingham Tool & Implement Company, Birmingham, has been organized with a capital stock of $65,000 for the manufacture of hay presses and implements. B. S. Webber has been elected president and E. D. H. Spiva secretary and treasurer.

Hampton W. Lay, Gadsden, Ala., reports that the water power rights of the Alabama Power Company have been sold to an English syndicate. They propose to develop power on the Coosa River.

The Wimberley Lake Oil Company will drill for oil at Stevenson, Ala.

Robert Gamble, Jacksonville, Fla., will build an ice factory at Montgomery to cost $25,000.

The Little Cahaba Coal Mining Company, Birmingham, will install electric power plant and equipment at mines at Piper and Coleanor.

The new contracting firm of H. W. McAfee & Co. has been formed at Columbus, Ga. H. W. McAfee is the head.

Application has been made by the Georgia Public Service Corporation for a franchise to operate an electric power company in that city. W. J. Massee and associates propose to operate a power house and car line.

Contract has been let to C. H. Holten to erect the main building for the plant of the Florida Metal Products Company, Jacksonville, Fla.

The Barrett Mfg. Company, which is building a tar paper and tar paving plant at Corey, Ala., has taken out a building permit for $66,000. It will secure the raw tar through a pipe line from the Koppers coke ovens of the Tennessee Coal, Iron & Railroad Company, about ¾ mile distant.

Birmingham, Ala., has adopted an ordinance granting exemption from taxation for a period of ten years to such manufacturing plants as locate there hereafter and employ a minimum of 20 hands for at least eight months in the year.

The Ashland Oil Mill & Fertilizer Works, Ashland, Ala., recently burned with $20,000 loss.

St. Louis

ST. LOUIS, MO., May 13, 1912.

The reports of the machine tool dealers, from week to week, bear much similarity these days. While there is a fair business doing, there is nothing like the good old times preceding the 1907 panic and the tendency is still to make comparisons therewith. At the same time, if the real facts were given, it is likely that the figures would show a very healthy state of affairs even if the totals were not so extremely large. The lists continue small and the inquiry is chiefly for single tools and some second-hand stuff. Collections are satisfactory.

The Stevens Railway Specialty Company, St. Louis, with $25,000 capital stock, has been incorporated by C. L. Lyle, H. L. Nixon and O. Keiser to manufacture railway supplies.

The Ruebel & Wells Consulting Engineer Company, Chemical Building, St. Louis, will receive bids until May 22 for an emergency water supply plant for the Fulton, Mo., state hospital No. 1, including one air compressor, one steel water tank and derrick, two motor-driven centrifugal fire pumps, one motor-driven centrifugal house service pump and necessary electrical accessories and equipment.

The Moon Bros. Carriage Company plant in St. Louis was burned May 9 with a loss of about $75,000. The plant and mechanical equipment will be re-installed.

The Kimmel Furnace Company, Kansas City, Mo., with $50,000 capital stock, has been organized and incorporated by J. C. and M. S. Kimmel and F. E. McCurdy to establish a plant for the manufacture of steel furnaces for heating purposes.

The M. E. Leming Lumber Company, Cape Girardeau, Mo., has been incorporated with $50,000 capital stock by M. E. Leming, L. E. Comer and W. A. Tibbs to equip lumber mills on property controlled by the incorporators.

The Automatic Register Company, a Delaware corporation, with A. D. Branham as president and Ernest Lane as general manager, has completed plans for the enlargement and removal of its plant which is now in the Metropolitan Building in East St. Louis. A new building will be built for the company. Its offices are in the Pierce Building, St. Louis, Mo.

The Missouri Pacific Railway has purchased the old Nevada Water Company plant near Nevada, Mo., and will re-equip it for the purpose of perfecting the water supply for its engines. Thirty thousand dollars will be spent.

The Thanksgiving Mining Company, Joplin, Mo., has been incorporated with $30,000 capital stock by A. C. Dixon, R. H. Barratt and D. K. Catlin to develop and equip mining property owned by the incorporators.

The Onondaga Mining Company, Joplin, Mo., has been organized by J. A. Rogers, J. G. Marcum and C. L. Wells to equip mining property with necessary machinery, etc.

The Sterling, Geneseo & Cambridge Railroad, with $200,000 preliminary capital stock, has been incorporated by Ray Rairdon of Morrison, Ill.; Abram Miller and G. R. Mannion of Hoopole to build and equip an electric railroad and necessary powerhouse to operate between Sterling and Galesburg.

The Central Refining Company, Lawrenceville, Ill., has increased its capital stock from $600,000 to $1,000,000 for the purpose of enlarging its equipment.

St. Louis capitalists, headed by R. W. Morrison, are preparing for the construction of a hydro-electric plant at Cotter, Ark., to supply current from that point as far south as Little Rock. About 15,000 hp. will be developed and the plant will cost about $1,500,000.

Texas

AUSTIN, TEXAS, May 11, 1912.

Unusually favorable prospects for another large cotton crop in Texas are creating a good demand for machinery for cotton gins, cotton compresses and cottonseed oil mills. New projects of this character are coming to light almost daily and there promises to be more of them carried to fulfillment both now and at the beginning of the cotton harvest than in any similar period for several years. Electrical development of various kinds also occupies a prominent place in the machinery trade of Texas and the Southwest. Besides the several new projected interurban electric railways there are quite a number of power and lighting plants now being installed and proposed.

The City Council of Cuero is preparing to begin the construction of a sewer system for which $25,000 bonds were recently issued. J. W. Benjamin, city engineer, will be in charge of the work.

James Stewart & Co. have been awarded the contract for the erection of the sheds and buildings for the new cotton compress that is to be installed at Texas City.

The Alamo Milling Company, San Antonio, has been organized with a capital stock of $9,000. The incorporators are James Prince, Juan Fadea and T. B. Weise.

The Crown Chemical Company, San Antonio, recently organized with a capital stock of $5,000, will manufacture chemicals of different kinds. The incorporators are W. R. Calhoun, Max B. Mayer, George M. Mayer and Ernest Deshleffsen.

The Hamilton Compress Company, Hamilton, has been organized with a capital stock of $10,000. The in-

corporators are W. L. Wood, H. F. Underwood and J. W. Murchison.

The Planters Oil Company will install a cotton-seed oil mill at Navasota at a cost of about $50,000. It will be of 40-ton daily capacity, using the cold press system. Dr. W. P. Wilson is president, John B. Rogers vice-president and L. T. Barryman manager.

It is announced by D. Mounday, general manager of the American Sugar & Refining Company, that the establishment of a large sugar beet factory at Portales, N. M., is practically assured.

W. H. Heath, of McNeal, and associates will establish a broom factory at McNeal, Ariz. More than 200 acres of broom corn are planted in that locality.

The cotton-seed oil plant of the Grayson Oil & Cotton Company at Sherman, Texas, has been acquired by a syndicate of Fort Worth men. It will continue to be operated under its present name and will be greatly enlarged by the installing of additional machinery and other improvements.

The Lindale Farmers Canning Company, which has a capital stock of $4,000, will install a canning plant at Lindale. The incorporators are T. L. Arthur, R. A. Miller, J. W. Dismukes and others.

Through the efforts of B. F. Drake, secretary of the Business Men's Club of Waco, the Ohio Valley Mfg. Company will establish a plant at that place for finishing furniture. The main factory building will be 65 x 100 ft., and three stores, of brick construction.

E. E. Holcomb of Stegler, Okla., will establish a cotton-seed oil mill at Nacona, Texas. The cold process will be used.

Bonds have been voted by the taxpayers of Shamrock for the construction of a system of waterworks.

The Thrall Gin Company will install a new cotton gin at Thrall at a cost of about $10,000.

The City Council of Floresville has granted a franchise to J. H. Spencer of San Antonio and associates to install an electric light and power plant. The construction work will be started by September 1.

C. H. Fowler is installing a new cotton gin at Stockdale.

The chamber of commerce of Denton has promoted the establishment there of a terra cotta factory. Large beds of clay suitable for the manufacture of terra cotta articles are located near there.

The City Council of San Marcos has granted a 25-year franchise to R. O. Langworthy of San Antonio and associates for the installation of a gas manufacturing plant and the construction of a distributing system. The improvement will cost about $40,000.

G. H. Harris, secretary of the Commercial Club of Cuero, is promoting the establishment of a brick manufacturing plant at that place.

The waterworks system and electric light plant at Mercedes have been purchased by S. M. Williams. He will install gasoline engines and make other improvements.

The Pacific Coast

PORTLAND, ORE., May 7, 1912.

While small tools and shop supplies are in good demand, the machine tool market remains quiet and featureless, though many shops note an increasing volume of work. The demand for other lines of machinery shows considerable improvement. The building situation, both here and at Seattle, Wash., is better than for many months. The lumber market, also, is in better shape, and this, with the adjustment of labor troubles in some of the lumber districts, has given a perceptible impetus to mill and logging machinery throughout the north coast district. Rapid progress is being made on many timber development projects, and there is a strong tendency toward the installation of improved equipment in all branches of the wood-working industry. Ship and boatbuilding plants are very busy, and canners are still in the market for boilers and special equipment. Large deliveries of both canning and mining machinery are going forward from Seattle, Wash., to various parts of Alaska.

The Lamb Machine Company, Hoquiam, Wash., is preparing to make a large addition to its plant. This company, which recently succeeded the Hoquiam Machine Works, manufactures a line of logging equipment, and has taken up the agency of the American Hoist & Derrick Company and several other lines.

A large shipment of sawmill machinery for the Philippine Islands was dispatched from Seattle, Wash., the first of the month.

A new foundry and machine shop owned by John Cotterill, Arlington, Wash., started operations late last month with a capacity business.

The Wallowa Light & Power Company, Wallowa, Ore., is preparing to add some new machinery to its plant.

Bids will be opened at Seattle, Wash., May 31, for a lot of electrical machinery for Fort Worden, Wash.

Work has just been started on a new factory building for the Seattle Cracker & Candy Company, Seattle, Wash.

The Palmer Calk Company, recently organized at Spokane, Wash., proposes to install a plant at that place for the manufacture of horseshoe calks.

The C. A. Smith Lumber Company, operating a large plant on Coos Bay, Ore., is preparing to make extensive improvements. It is reported that the company will build a 12-in. suction dredge, and plans are being drawn for a good-sized pulp mill to be erected near the present lumber mill.

The Clark County Box & Lumber Company, a new firm at Vancouver, Wash., is planning to put in a lot of new machinery.

The Auburn Woodworkers Company, Auburn, Wash., has completed plans for a new box factory, and will install a complete outfit of modern machinery.

The Coe Mfg. Company, Painesville, O., will furnish a large veneer manufacturing outfit for the Wheeler-Osgood Company, which is installing a new plant at Tacoma, Wash.

The Siemons Lumber Company, Bellingham, Wash., has just completed the installation of a number of shingle machines.

The Columbia Box & Lumber Company, South Bend, Wash., has just put in a new Allis-Chalmers air-lift trimmer.

The N. P. Bogle Lumber Company, St. Maries, Idaho, is preparing to erect a large sawmill with two large band saws and a lath machine.

It is reported that the Idaho Portland Cement Company is getting ready to install a plant at Asotin, Wash.

The Pacific Fruit Package Company, Raymond, Wash., is building an addition to its factory, and will put a lot of new veneer and package machinery.

The Grande Ronde Lumber Company, Perry, Ore., whose plant was recently burned, has placed an order for a complete new outfit with the Diamond Iron Works, Minneapolis, Minn. The order includes two band mills, a resaw, box and lath machines.

Eastern Canada

TORONTO, ONT., May 13, 1912.

Manufacturers in various centers of eastern Canada report that they are operating under the disadvantage of a labor shortage. They point out that this condition is caused in some degree by lack of houses suitable for workingmen. This complaint is becoming rather general, and is heard alike from large cities and small towns where important factories of large capacity are located. Boards of trade, city councils and labor unions are using their influence to direct enterprise to the building of dwellings for wage earners. At the same time, the building industry is in a very flourishing and active state all over Canada. Another point in respect to which there is more or less agitation in many industrial centers is that of establishing a municipal policy for providing factory sites at reasonable prices. Both these features are noteworthy as indications of the state of manufacturing industry in Canada.

A specially equipped trainload of eastern Canada factory products will leave Toronto next Wednesday on a tour of the western provinces. It is expected to have educational as well as advertising value, especially by way of illustrating the work of the national policy in building up the manufacturing industries of eastern Canada. It remains to be seen whether the West will be so far impressed with the demonstration as to put its confidence in that policy and look for like developments from it in that part of the country.

The ratepayers of St. Catharines, Ont., have carried a by-law to bonus the Canadian Warren Axe & Tool Company, which will manufacture all kinds of axes and logging tools. The concern will be a branch of a similar factory now operating at Warren, Pa. The company will be granted a free site and a fixed assessment of $5,000 for 10 years, and will be given free city water up to $200 worth yearly. The company agrees to erect buildings valued at $40,000 and to pay annually in wages $25,000.

The location of a branch plant of the Buffalo Union Furnace Company at Port Colborne, Ont., was arranged last week. This will be the largest industry, when completed, yet located there, and it is expected to bring several stove factories to use the products of the steel plant.

Sir Donald Mann, Toronto, vice-president Canadian Northern Railway, is in London, England, where, it is stated, he is arranging for the enlargement of the works of the Atikokan Iron Company at Port Arthur, Ont.

The Toronto Carpet Company, Toronto, has purchased from the City Council a parcel of land adjoining the site on which its existing factory stands, on which it will erect an additional factory building to cost $100,000.

The National Automobile Body Company, with a capital stock of $150,000, has just been organized and will at once begin the erection in Windsor, Ont., of a large plant, giving employment to about 100 men at the start. Three acres in Windsor's new factory district has been secured, and the projectors expect that this will be added to within the next year.

Fire visited the factory of the Tolton Mfg. Company, Stratford, Ont., last week. The roof was practically destroyed, while the top floor was badly burned and the machinery and furniture were damaged by water.

The Capital Wire Cloth & Mfg. Company will at once begin the construction of its plant at Hintonburg, Ont., near Ottawa. J. R. Buchanan, president of the company, will go to Wisconsin in a few days to make arrangements for purchasing the machinery that will have to be bought and installed. The firm will manufacture wire cloth and other lines needed in the making of paper.

The Eureka Planter Company, Woodstock, Ont., manufacturer of various lines of farming implements, has completed final arrangements for a western branch to be located at Bashaw, Alberta.

The Dominion Thread Company, Guelph, Ont., is about to call for tenders for the construction of its plant.

The Riordan Paper Company, Montreal, has increased its capital stock to $6,000,000.

The new paper mill that Price Bros. & Co. have been building at Kenogamie, Que., is about completed. In the new building there will be installed three units for the manufacture of paper, each capable of producing 50 tons per day. Provision has been made for the installation at any time desired of a fourth unit with a 50-ton daily capacity. Before the end of July the first unit will be in full operation and the other two will also be completed by December 31, 1912.

The Council of Sarnia, Ont., will take up the matter immediately of installing electrically operated pumps for the waterworks system at a cost of $50,000.

The Meaford Mfg. Company, Meaford, Ont., is preparing plans to build a $30,000 factory.

Western Canada

WINNIPEG, MAN., May 9, 1912.

Local machinery houses are doing a big volume of business. In addition to the large amounts of different kinds required for new industries throughout the West, there is a brisker demand than a year ago for parts for repairs, and numerous consignments of new machinery to increase the capacities of plants already established. The most active lines are lumber mill supplies, grain elevator requirements and materials for public utilities such as water works, electric lighting, etc. The outlook all through the western provinces is unusually encouraging, and there are indications that industrial expansion will continue all through the year.

The Overland Mfg. Company, Vancouver, B. C., is establishing a plant at Battleford, Sask., for the manufacture of doors, sash and general woodwork.

Schroeffer & Johnson, contractors, International Falls, Minn., are preparing to establish a woodworking factory at Fort Frances, western Ontario. It will be run by electrical power. The site for the industry has already been purchased.

It is said that Dr. Wright, a chalk manufacturer of Spokane, Wash., will establish a branch factory at Medicine Hat, Alberta.

The Alberta-American Ornamental Iron Company, Ltd., with a capital stock of $200,000, has been organized under the laws of Alberta, and is establishing a factory and head offices at Redcliffe, Alberta.

The Redcliffe Mill & Elevator Company, Ltd., Redcliffe, Alberta, is increasing the capacity of its flour mill and erecting a grain elevator of 30,000 bushels capacity.

German capitalists, with whom Alvo Von Alvensleben, Vancouver, is associated, have bought a waterfront site on Burrard Inlet near Port Moody, B. C., and will erect a large sawmill.

The Everett Sash & Door Company, Ltd., 319 Winch Building, Vancouver, B. C., has been incorporated with a capital stock of $10,000 to manufacture doors, sash, mouldings, etc. G. A. Bell, Vancouver, is the company's attorney.

The Esquimalt Development Company, Ltd., 607 Sayward Building, Victoria, B. C., has been incorporated with a capital stock of $500,000. It will carry on business as timber and lumber merchant and sawmill proprietors.

The Seaman Kent Company, Ltd., 837 Hastings street, Vancouver, has been incorporated with a capital stock of $500,000 to manufacture lumber, timber, etc., in British Columbia. F. R. M. Russell is the attorney.

The Canadian United Lumber Company, Ltd., Coquitlam, B. C., has been organized to erect a large sawmill there.

The City Planing Mills, Saskatoon, Sask., has been succeeded by a new organization called the Northern Planing Mills, Ltd., and the plant will be extended and modernized. E. A. Hogg is the president of the company.

It is announced that the Powell River Pulp & Paper Company, Ltd., Powell River, B. C., is planning to double the capacity of its plant.

The sawmill of the Interior Lumber Company, Sapperton, B. C., which burned some time ago, will be replaced by a larger plant than the one destroyed.

The Canada Malting Company, Calgary, Alberta, is having plans prepared for a new malting plant. J. Stewart & Co., Chicago, are the architects.

The ratepayers of Biggar, Sask., have voted the necessary money for the completion of the water-works system.

The Eureka Planter Company, Woodstock, Ont., is reported to have decided to establish a plant at Bashaw, Alberta. The company will undetake to put into shape some of the agricultural machinery dropped because of slight breakages. It will also manufacture grain bins and do a general implement business under the name of the Western Implement Works.

The Garden City Feeder Company, Ltd., Regina, Sask., has been incorporated under Dominion Government charter to manufacture and sell agricultural implements, threshing machines and feeders for threshing machines.

Government Purchases

WASHINGTON, D. C., May 13, 1912.

The United States Engineer Office, Seattle, Wash., will open bids May 31 for furnishing and erecting two steel traveling cranes.

The Chief Quartermaster, Chronicle Building, San Francisco, Cal., will open bids May 31 for the construction of an electric lighting system at Fort Columbia, Wash. and for furnishing and installing engine, generator and switchboard in present power plant at Fort Stevens, Ore.; also for construction of feeder lines and pump house with pumps and motors for the above fort.

The Treasury Department, office of the supervising architect, Washington, will open bids June 11 for an air-lift pumping plant in the United States postoffice, London, Ky.

The Isthmian Canal Commission, Washington, will open bids May 22, under canal circular 705, for furnishing transformer room equipment for all Panama Canal locks.

The supervising architect, Treasury Department, Washington, opened bids May 6 for furnishing two engines and generators in the United States Custom House, Cincinnati, Ohio, as follows:

Kerr Turbine Company, Philadelphia, Pa., $7,610; Ball Engine Company, Philadelphia, Pa., $11,381; Harrisburg Foundry & Machine Works, Harrisburg, Pa., $13,300; Ridgeway Dynamo & Engine Company, Ridgway, Pa., $11,075.

For furnishing an oil-burning plant for heating boilers in the United States postoffice at Stockton, Cal., as follows:

S. T. Johnson Company, San Francisco, Cal., $965; T. B. Jarvis Crude Oil Burner Company, San Francisco, Cal., $1,250; Fess System Company, San Francisco, Cal., alternate bid, $1,091.50.

The lighthouse inspector Third District, Tompkinsville, N. Y., opened bids April 23 for furnishing and delivering boiler and fittings for lighthouse tender Myrtle as follows: P. Delany & Co., Newburgh, N. Y., $5,494; Theodore Smith & Sons Company, Jersey City, N. J., $5,750.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids May 7, under schedule 4774, class 54, for one electric-driven winch as follows:

Bidder 62, Exeter Machine Works, Pittston, Pa., $660; 118, Lenber Engineering Company, New York, $690; 118, Lidgerwood Mfg. Company, New York, $825.75; 123, J. S. Mundy, Washington, D. C., $650; 132, Meade-Morrison Mfg. Company, Cambridge, Mass., $895; 188, South Norwalk Engineering Company, South Norwalk, Conn., $1,080; 227, American Engineering Company, Philadelphia, Pa., $650; 241, F. S. Banks & Co., New York, $524.50.